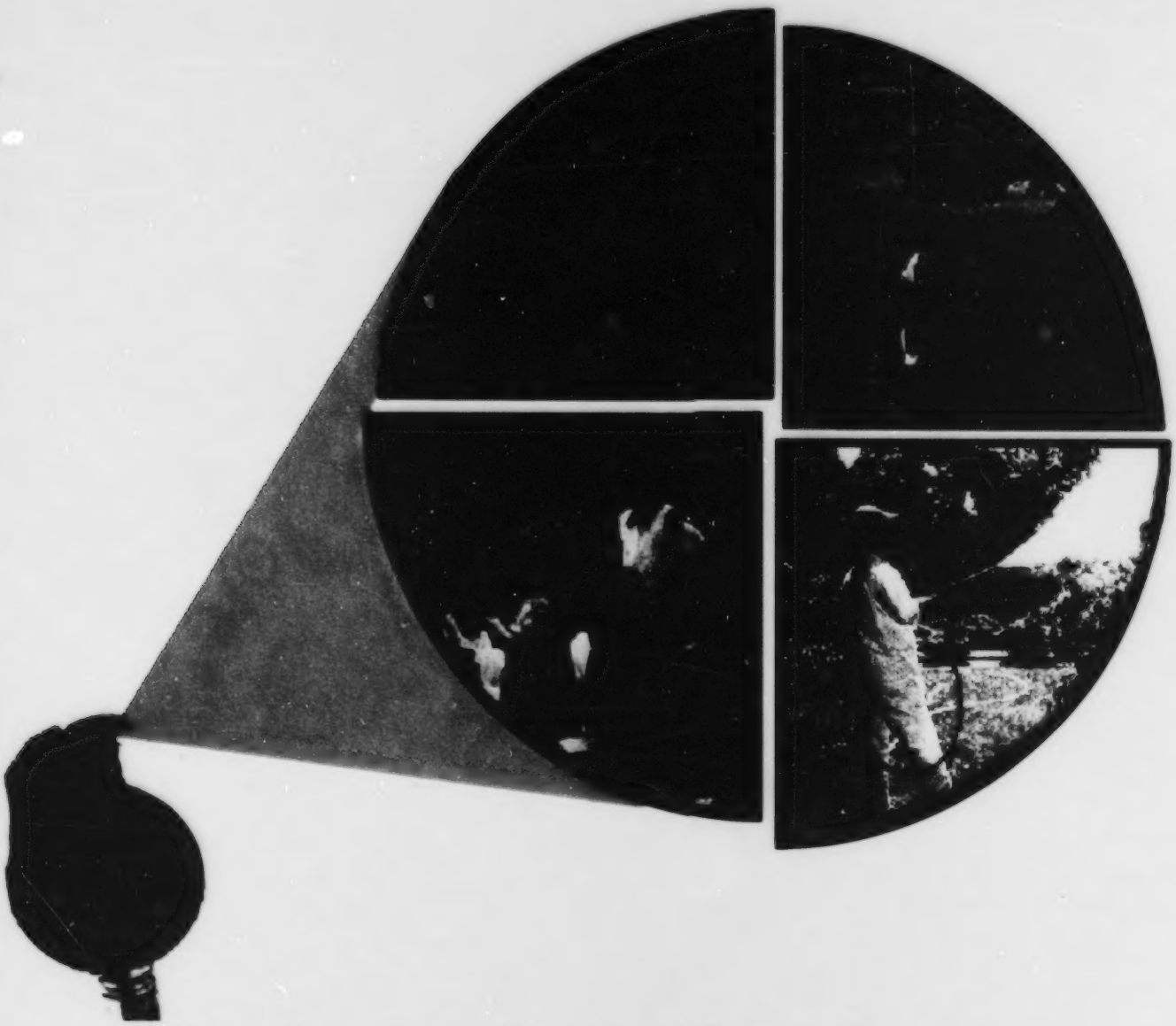
PESTICIDES



Making the Right Choice

For the Protection of Health and the Environment

HOUSE OF COMMONS
CANADA

Standing Committee on Environment and Sustainable Development

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PESTICIDES

MAKING THE RIGHT CHOICE

FOR THE PROTECTION OF HEALTH AND THE ENVIRONMENT

Report of the Standing Committee on Environment and Sustainable Development

May 2000

ENVIRONMENTAL CHOICE
CHOIX ENVIRONNEMENTAL

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THE STANDING COMMITTEE ON ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

has the honour to present its

FIRST REPORT

In accordance with its permanent mandate under Standing Order 108(2), your Committee undertook, beginning in June, 1999, a study on the management and use of pesticides in Canada including an evaluation of the performance of the Pest Management Regulatory Agency in preventing pollution and in protecting the environment and human health.

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CHAIR'S PREFACE TO THE REPORT

During the past twelve months the Standing Committee on Environment and Sustainable Development of the House of Commons has studied not only the extent of, and the reasons for, the use of pesticides, but also their impact on human health and the environment. We have also studied the economic implications of their use and the administrative responsibility for regulating them.

Clearly, as a society, we have become very dependent on the use of pesticides. This does not mean, however, that we are unable to alter such practices. We can all think of other products which were once widely used in our society and today have been abandoned because of changes in values and attitude. Prime examples include the use of tobacco, asbestos and lead. The major shift with respect to public acceptance of smoking would not have been contemplated two decades ago. The same can be said about the use of lead in gasoline — now mostly a thing of the past — yet deeply entrenched when the first concerns about its neurotoxicity emerged. A similar pattern can be found in the use of asbestos in buildings, once prevalent and now banned.

As we all know, governments act with greater speed and resolution when clear arguments are made about dangers posed to public health. At times governments have acted without waiting for the smoking gun, but at other times reluctantly due to competing views by sectoral interests. In the meantime, the public bore the costs of protracted inaction, be it in the form of pulmonary diseases and cancer in the case of tobacco and asbestos, or in the form of lower IQs and learning disabilities in children, as in the case of lead. With pesticides, we have good reasons to worry about public health, safety and the special vulnerability of our children. Public health groups, including family physicians, were very forceful and persuasive in expressing to the Committee their deep concerns about the current pervasive use of pesticides in our society. Citizens are not waiting for the smoking gun to act; they are taking action to reduce, and in some cases ban the use of pesticides for cosmetic purposes in their communities.

When we looked at the economic side of this issue, a key question emerged: can our present food production and distribution systems, which are so integral to our daily lives, survive in the absence of pesticides? The frank answer is that our reliance on pesticides in agriculture is so overwhelming, it would be impossible for us to abandon their use in the short term. Unfortunately, there is no replacement system readily available, no instant or magic solution. There is much debate as to whether an adequate food supply, at a reasonable price for consumers and a lesser cost to farmers, can be brought to market without pesticides. When could organic farming become an economically viable alternative for farmers and consumers and under what conditions?

The European Union (EU) has experienced a remarkable growth in organic agriculture in the last decade, particularly in Austria, Finland, Greece, Italy, Spain and Sweden, due to the introduction of EU and national grants. The land being farmed organically in Europe has increased about eight times between 1987 and 1997, with Austria leading the way. The European Union's aim is to have 2.5% of all farms in organic production by early this year while the Austrian government has set a target of 20%. The Committee hearings made us aware that we should have started long before now to plan and build such a replacement system in Canada, in light of the strong evidence that chemical pesticides are detrimental to our environment, health and particularly our children's health.

We looked at the current system of regulating pesticides in Canada and we asked ourselves whether it is possible for one agency, the Pest Management Regulatory Agency (PMRA), to perform two virtually conflicting tasks, namely that of approving chemical pesticides as requested by industry while at the same time regulating them in order to protect human health. We asked ourselves whether it is possible to strike a balance between economic and health protection goals. The Minister of Health described the conflict himself on May 28, 1999 in Question Period when he said:

> the PMRA has to balance public safety and environmental concerns against the needs of producers and growers.

We found, however, that pesticides are highly poisonous substances designed to kill living organisms and are thus potentially harmful to workers using them and to farming and urban communities unknowingly exposed as well as to consumers. Therefore, we asked ourselves whether a regulatory system could be designed that would give clear and absolute precedence to human health. Based on our findings, it must be designed as such.

The choice facing us is clear: either to continue with our chronic dependence on pesticides to the detriment of the environment, agricultural sustainability and human health or, to give public health protection clear precedence. We have already done so with tobacco, lead and asbestos. Pesticides should be next.

Charles Caccia
Member of Parliament for Davenport
Ottawa, May 2000

EXECUTIVE SUMMARY: KEY DIRECTIONS FOR CHANGE

Canadians live in one of the healthiest nations in the world. They also live in the world's second largest country, renowned for its rich biodiversity and varied ecosystems. If this impressive legacy is to be preserved and passed on to future generations, decisive action must be taken to curb the use of pesticides and other harmful pollutants.

The 30-year old *Pest Control Products Act* may soon be amended; draft legislation is being developed. This opportunity must be seized to integrate in the new legislation the fundamental principles that will guide pest management decisions in the years to come. The package of amendments proposed by the Pest Management Regulatory Agency (PMRA) in January 1999 contains serious omissions and flaws. In the Committee's opinion, the new legislation must be comprehensive and progressive in design and thrust. It must articulate a vision for pest management that will withstand the test of time. It must also set forth a blueprint for action that, in the short term and the long term, will best protect the health of Canadians and the environment.

In preparing this report, the Committee was guided by the following principles:

- to make the protection of human health and the environment the absolute priority in pest management decisions, especially the protection of children and other vulnerable populations;
- to ensure that a precautionary approach is taken in decision-making;
- to promote and increase reliance on pollution prevention strategies; and
- to foster public confidence by actively informing and involving Canadians.

The Committee recommends that these principles form the basis of the new legislation. However, they must be enshrined not only in the preamble, but in the legislation's operative sections as well. Statements in the preamble, while an important expression of the government's intentions, do not have the weight or enforceability of the operative sections. Real action is called for and not just statements of good will. It is therefore essential that these principles be "operationalized" throughout the new Act, including codifying them in an administrative clause similar to section 2 of the new *Canadian Environmental Protection Act, 1999*.

Giving Absolute Priority to the Protection of Human Health and the Environment

The protection of human health and the environment must be paramount under the new legislation. Notably, this guiding principle must be incorporated in the mandate that the Committee recommends be enacted for the PMRA and the Minister's advisory body, the Pest Management Advisory Council. By giving these two bodies a clear, unequivocal statutory mandate, it will no longer be necessary to balance public safety and environmental concerns against the needs of growers and industry. Rather, public safety and the environment will be paramount. This strengthened mandate will be more in

keeping with the reason for creating the PMRA within Health Canada, as opposed to another department such as Agriculture and Agri-Food Canada. It should also dispel existing concerns about the Agency's dual or conflicting mandate and its industry-driven agenda.

Making the protection of human health and the environment the central priority must be backed up by comprehensive research. Pesticides are known to play, or are suspected of playing, a role in a myriad of diseases and developmental abnormalities, including cancer (brain, breast, stomach, prostate and testicles), childhood leukemia, reduced fertility, damage to the thyroid and pituitary glands, lowered immunity, developmental abnormalities and behavioural problems. However, pesticides that might cause harm, but that have not been proven to do so on a weight of evidence basis, are not likely to be pulled off the market or refused registration. It is therefore critical that research be undertaken to provide that degree of scientific certainty needed to support precautionary action.

The Committee recommends that research be conducted in a number of key areas. In general, more comprehensive and in-depth research must be carried out on the effects of pesticides on the environment and human health. More specifically, there is a pressing need for increased research on endocrine disruptors, including the development of a specific protocol to detect the effects of endocrine disrupters on human health. Research must also be carried out on chemical groups of pesticides whose effects on human health are still relatively unknown, such as synthetic pyrethroids and phenoxy herbicides. Research is also needed in the case of integrated pest management strategies. If reliance on pesticides is to be reduced, it is important that alternative strategies be developed.

In recognition of the special vulnerability of children, the Committee also recommends that research be continued to determine the adequacy of having an additional safety factor of 10 in the risk assessment process to protect child health. A comprehensive pesticides research program must also be developed in relation to child health, which must focus on the developmental and physiological characteristics of children and their daily activities. Research is also needed to determine the effects of pollutants on fetal development.

In addition to these research initiatives, the Committee recommends the creation of three databases under the new legislation. One database would document the sale of pesticides throughout the country, as well as selected pesticide uses, thus providing vital information that might establish links between pesticide use and harm to human health and the environment. The second database would document any adverse effects that had been reported in relation to pesticide use. Registrants, in particular, would contribute to this database as a condition of registration; the Committee recommends that they be required to conduct post-registration monitoring on a routine basis and report any adverse effects observed. The third database would provide information on alternatives to pesticides and would thus constitute a key tool in support of pollution prevention strategies.

While the protection of human health and the environment requires that research and monitoring activities be stepped up to better identify the problems related to pesticide use, the evidence of harm is sufficiently clear-cut in some cases to justify concrete action. This is the case with respect to Track 1 substances under the federal Toxic Substances Management Policy. As the Committee recommends, the new Act must explicitly disallow registration or re-registration of any pesticide containing a Track 1 substance. The PMRA must also set out science-based inherent toxicity criteria. Any new pesticides that meet these criteria should also be refused registration, while those already on the market should be de-registered.

The new Act must specifically require an assessment of cumulative and aggregate risks, as well as the possible interaction between pesticides, particularly in relation to setting maximum residue limits. Tests for neurotoxicity and endocrine disruption should also be carried out on a mandatory basis.

Formulants and contaminants, including microcontaminants, must be subject to thorough assessment, and if any of these substances are found to be toxic within the meaning of section 64 of the *Canadian Environmental Protection Act, 1999*, information to this effect would have to be disclosed on the product's label as a condition of registration. The new Act must also explicitly retain efficacy evaluations as part of the value assessment, thus ensuring that such evaluations are not dropped in an effort to harmonize the Canadian system with that of other countries. Given the lack of long-term data on pesticides used on genetically modified plants, the Committee recommends that such uses be treated as a new use under the revised legislation, thus necessitating an assessment and an amendment to the certificate of registration if the use is approved.

As a buffer against the current uncertainty surrounding the exposure and sensitivity of children and other vulnerable groups to pesticides, the new Act should prescribe a minimum additional safety factor of 10 in assessing risk. This additional safety factor should be applied in all cases and not just in determining the maximum residue limits in foodstuffs. What constitutes an "unacceptable risk" should be based on child health criteria.

More than 7000 pesticides are registered for use in Canada, many of which contain active ingredients that have not been re-evaluated for years. In fact, of the 500 active ingredients contained in registered products, over 300 were approved before 1981 and over 150 before 1960. Because most of these were assessed under the "adult male" standard applied in the past, the Committee believes that the new Act should require the formal re-evaluation of all pre-1995 pesticides by no later than the year 2006, using the upgraded assessment standards recommended in this report, including an evaluation of all product ingredients (active ingredients, formulants and contaminants), cumulative and aggregate effects and the additional safety factor of 10. To ensure that pesticides do not go unreviewed for years, as is currently the case, the new Act must also require that registered pesticides be formally re-evaluated every 15 years from the date of last review. Provision must also be made for special reviews on an ad hoc basis. In the Committee's opinion, a special review should be undertaken on a mandatory basis when a pesticide has been banned for safety reasons in a member country of the Organization for Economic Co-operation and Development (OECD). Special reviews could also be allowed on other grounds, such as scientific advancement or public requests.

Considerable energy is being devoted to the harmonization of pesticide regulatory systems among Canada's major trading partners. While harmonization may have merit, it must not become a race to the bottom. To guard against this possibility, there must be a clause in the operative sections of the new legislation to preclude a weakening of the Canadian standards.

A Precautionary Approach in the Decision-Making Process

The lack of scientific certainty should not be allowed to impede effective action to protect human health and the environment against actual or suspected harm caused by pesticides. It is, therefore, imperative that the new Act embrace a precautionary approach in all aspects of decision-making. The Committee recommends the adoption in the new Act of the precautionary principle that is contained in the 1996 Protocol to the London Convention of 1972 on disposal of waste at sea. This definition,

in the Committee's opinion, provides broader scope for precautionary action than the other definitions examined. Adjusted to reflect the pesticide context, this definition of the precautionary principle would provide that :

> Appropriate preventive measures are to be taken where there is reason to believe that a pesticide is likely to cause harm, even when there is no conclusive evidence to prove a causal relation between the pesticide and its effects.

Many of the recommendations outlined above are based on a precautionary approach. For example, the Committee recommends the inclusion of an additional safety factor of 10 in the assessment process because too little is known about the effects of pesticides on children and other vulnerable populations. The recommendation to treat as a new use the application of a pesticide on a genetically modified plant is also based on a precautionary approach because too little is known about the effects of pesticides on genetically modified plants.

The Committee recommends that the new pesticides Act require that protection of human health and the environment according to the precautionary principle be Canada's sole objective in any action to harmonize Canadian standards with those of other countries. A further recommendation requires the application of the precautionary principle to resolve disputes between federal departments and agencies about particular pesticide uses. These measures are in addition to the more general recommendation to enshrine the precautionary principle in the preamble, as well as in an administrative clause under the new Act.

Placing the Emphasis on Pollution Prevention Strategies

The most effective way to protect human health and the environment is undeniably to prevent the generation of polluting substances in the first place, rather than minimizing or managing the risks associated with their use. Pollution prevention must thus be emphasized in the new Act. Federal departments and agencies should lead the way. They must set an example by routinely reporting their pesticide uses to Parliament and by developing and employing alternative strategies and pesticide use reduction plans.

The need to promote sustainable pest management strategies that seek to reduce use, risk and reliance on pesticides must be made an explicit component of the PMRA's mandate under the new legislation, as must the need to develop safer pest control products. To further these goals, the PMRA should develop and implement a comprehensive pesticide reduction policy that would apply to all of its activities, including the registration process. The new Act must authorize the application of the substitution principle to promote the replacement of pesticides with less toxic products and non-chemical alternatives.

The PMRA must also revise its integrated pest management program to give priority to reduced pesticide use and the development of organic farming practices. Given that the promotion of integrated pest management strategies is a shared responsibility with other federal, provincial and territorial departments, a number of recommendations are directed not at the PMRA, but at the federal government, to promote organic farming, notably through increased research and public education and the provision of financial incentives to make this alternative more economically viable.

Most witnesses were of the opinion that the use of pesticides for cosmetic, lawn-care purposes should be disallowed. Given what is known or suspected about the harmful effects of these products and given the purely esthetic purposes they serve, the Committee favours a ban on the use of pesticides for cosmetic purposes. Such a ban would constitute a major step toward pollution prevention. It is questionable, however, whether the Canadian public would accept a country-wide ban at this time. It is therefore essential to enlist public cooperation by sensitizing people to the risks of pesticides through an aggressive education campaign. Hopefully, the use of pesticides for cosmetic purposes will become as frowned-upon as smoking cigarettes in public, thus making a full moratorium a more socially acceptable solution. The Committee, therefore, proposes a more gradual approach. We recommend that the new Act disallow all new registrations of pesticides for cosmetic uses. The new Act should concomitantly disallow registration renewals for those currently on the market, once their registration certificate has expired. Since registrations must be renewed every five years, the Committee's proposal essentially amounts to a maximum five-year phase out of pesticides used for cosmetic purposes.

Building Public Confidence by Actively Informing and Involving Canadians

The need to involve Canadians in the decision-making process and to inform them about the pesticides used in their environment was one of the clearest messages received by the Committee. It is essential that Canadians have confidence in the federal pest management system set up for their benefit and in the Agency entrusted with its administration. The key to fostering public confidence is to enact an open and transparent process.

The Committee makes a number of recommendations to open up the PMRA's "closed shop." The new legislation must provide the broadest possible disclosure of information to the public. It must also facilitate the public dissemination of this information through the mandatory establishment of an electronic public registry that would provide detailed information not only about the pesticides in use or proposed for use in Canada, but also about the PMRA's policies, proposals, decisions and actions. In addition, the PMRA should be required to provide a digest of its activities through the tabling of an annual report in Parliament. Members of the public must not only be informed, they must also be provided with an opportunity to participate in decision-making. The new legislation should contain mandatory provisions to notify the public of pending proposals, decisions, actions and policies. Public input should be solicited and taken into consideration. Canadians should also be given the opportunity to appeal major registration decisions in appropriate cases. In order to encourage the general public to come forward when an offence has been or is about to be committed, the new Act should provide comprehensive whistleblower protection.

In recognition of the special information needs of health care professionals, the Committee further advocates the establishment of a 24-hour medical emergency information service on pesticides and other toxic substances to enable medical practitioners to make timely diagnoses and prescribe appropriate treatment. It is also important that workers who handle pesticides be given the same rights and protections afforded other workers who deal with chemicals. Pesticides must, therefore, be brought within the family of chemicals covered by the Workplace Hazardous Material Information System (WHMIS).

The Committee places great stock in informing and involving Canadians. For this reason, we have recommended that the PMRA be expressly mandated under the new legislation to inform and educate the public about pesticides and the risks associated with their use. The responsibility of educating the public about the risks associated with the use of pesticides and the availability of less harmful alternatives, however, should not be borne exclusively by the PMRA. Many federal government departments, as well as provincial and territorial governments, can play a crucial role in this regard. They can also make a vital contribution toward the development of alternative pest management strategies. Cooperative and coordinated action within government is essential and the Committee has made a number of recommendations to this effect. In particular, cooperative action is needed at the federal level through the development and implementation of comprehensive memoranda of understanding.

The use of pesticides must come to be regarded as a measure of last resort rather than the option of choice. Attitudes about pesticide use must be changed through aggressive public education programs. Effective steps must be taken now to protect human health and the environment against the risks associated with pesticide use. The new legislation must reflect this priority in all of its provisions, notably, by promoting the use of sustainable pest management strategies that seek to reduce use, risk and reliance on pesticides.

This new focus should be reflected in the title of the new legislation. The title of the current Act – the *Pest Control Products Act* – implies that pesticide "products" are needed to control pests. This message is erroneous and must be corrected. The new Act should be renamed the "Pest Control Act" to reflect the more comprehensive approach to pest management advocated in this report.

INTRODUCTION

As with every report, there are very good reasons for writing this one. To begin with, a study into the use of pesticides and their impact on human health and the environment is overdue.

The federal *Pest Control Products Act*, which governs pesticides and their use in Canada, has not undergone any major amendment since 1969. The activities of the Pest Management Regulatory Agency, the branch within Health Canada that administers the Act, have not been publicly scrutinized since the Agency's inception in 1995. In addition, of the more than 7000 pesticides approved for use in Canada, many have not been re-evaluated for years. Their safety has therefore not been reassessed to account for the vulnerability of children and today's more stringent standards for risk assessment. Thus it appeared timely to examine the pesticides management system in Canada.

Other reasons for carrying out this study include the observations made by the Commissioner of the Environment and Sustainable Development in a report released in May 1999. The Commissioner highlighted the connection between pesticides and the health of Canadians and underscored the need to improve what he deemed to be a deficient pesticide management system. In particular, the Commissioner stated there was an urgent need to re-evaluate long approved pesticides based on new, more rigorous standards.

Scientific and medical journals increasingly report the risks posed to human health by pesticides, including links between pesticides and diseases such as breast cancer and non-Hodgkin's lymphoma. One should also mention the mounting evidence of the negative impacts of pesticides on wildlife and the environment, all of which have prompted Canadians to register their disapproval of pesticides and take action to reduce their use.

Canada's international commitments provided added incentive. In May 1997, Canada signed the *Declaration of the Environment Leaders of the Eight on Children's Environmental Health*,[1] which gives priority to environmental issues affecting children's health. Canada was also the first country to ratify the 1998 Protocol on Persistent Organic Pollutants (POPs) under the UN Economic Commission for Europe's 1979 *Convention on Long Range Transboundary Air Pollution*. This Protocol lists 16 POPs substances, 11 of which are pesticides. At present Canada is engaged in negotiations under the United Nations Environment Program to develop a legally binding treaty regarding 12 POPs substances.

The last reason for this report is the specific reference to pesticides in the Speech from the Throne of October 12, 1999:

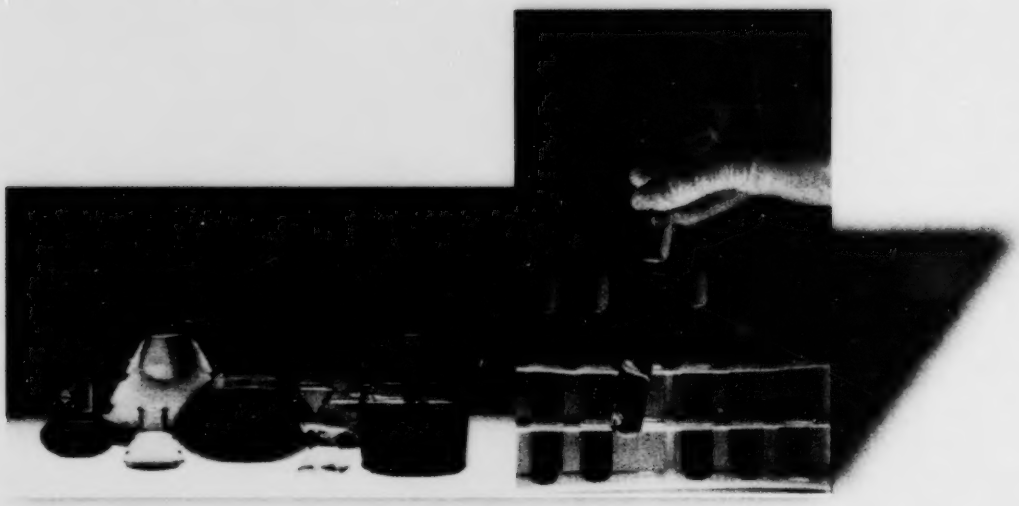
> The Government will protect the health of Canadians by strengthening Canada's food safety program, by taking further action on environmental health issues, including the potential health risks presented by pesticides, and by modernizing overall health protection for a changing world.

[1] Declaration signed by members of the G-8.

This report is the work of a dedicated Committee which, as of June 1999, held 38 meetings, heard testimony from 85 witnesses and analyzed over 50 briefs. A special expression of thanks goes to the team of researchers, the Committee Clerk and all his staff.

Ottawa, May 2000

PART A:
BACKGROUND



1. THE FEDERAL REGULATORY SYSTEM AND THE ROLE OF THE PEST MANAGEMENT REGULATORY AGENCY

1.1 The regulation of pesticides is a shared responsibility between the two levels of government in Canada. The federal government is responsible for the pre-market approval and registration of pesticides, while the provinces and territories regulate the post-registration sale, use and distribution of the products within their boundaries. Depending on their enabling legislation, municipalities may also play a role in regulating use at the local level.

1.2 The authority for regulating pesticides at the federal level is provided under the *Pest Control Products Act*. Section 5 of this Act generally prohibits the sale or importation into Canada of any "pest control product" unless the product has been assessed and registered, it conforms to prescribed

standards, and it is packaged and labelled in the prescribed manner. Given the broad definition of "pest" and "control product" in section 2 of the Act,[2] this general prohibition applies to all manner of pest control products, including fungicides, insecticides, herbicides and antimicrobials such as disinfectants, swimming pool chemicals and wood preservatives. For ease of reference, the more generic term "pesticide" will be used throughout this report, even though the term is not used in the Act.

1.3 The Act is supplemented by the Pest Control Products Regulations. These regulations set out detailed provisions respecting the pre-market assessment and registration of pesticides, the cancellation or suspension of registration certificates and the labelling and packaging requirements. A further set of regulations prescribes the fees to be paid for product assessment and registration, and for maintenance of the registration certificate. These regulations are entitled the Regulations Prescribing the Fees to be Paid for a Pest Control Product Application Examination Service Provided by or on Behalf of Her Majesty in Right of Canada, for a Right or Privilege to Manufacture or Sell a Pest Control Product in Canada and For Establishing a Maximum Residue Limit in Relation to a Pest Control Product.

1.4 The *Pest Control Products Act* and companion regulations are formally administered by the Minister of Health. The day-to-day operations, however, are carried out by the Pest Management Regulatory Agency (PMRA). The PMRA was created within Health Canada in April 1995 to consolidate, under a single agency, the resources and responsibilities for pest management regulation at the federal level. Prior to the PMRA's establishment, several federal departments were involved in the decision-making process, namely, Health Canada, Environment Canada, Natural Resources Canada, Fisheries and Oceans Canada and Agriculture and Agri-Food Canada, whose Minister was responsible for administering the Act. Although no longer involved in the decision-making process, these departments support the work of the PMRA, primarily through research and monitoring activities in their respective fields of expertise.

1.5 In order to register a pesticide for use in Canada, an applicant must submit detailed scientific tests and studies to the PMRA respecting the product's safety and value. Based on this information, the PMRA conducts a risk assessment, which considers the inherent toxicity of the product, the degree to which humans as well as the target and non-target environment may be exposed to it, and the possible harm to human health and the environment that might result. A value assessment is also carried out, which considers whether the use of the product will contribute to pest management and whether the application rates are the lowest possible to effectively control the target pest. It should be noted that the PMRA does not conduct its own tests when assessing a pesticide. Rather, it carries out a scientific review of the test data submitted to it by the applicant. The assessment process is discussed in detail in Chapter 8.

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[2] The Act defines "pest" to mean "any injurious, noxious or troublesome insect, fungus, bacterial organism, virus, weed, rodent or other plant or animal pest, and includes any injurious, noxious or troublesome organic function of a plant or animal."
The term "control product" is in turn defined to mean "any product, device, organism, substance or thing that is manufactured, represented, sold or used as a means for directly or indirectly controlling, preventing, destroying, mitigating, attracting or repelling any pest and includes
(a) any compound or substance that enhances or modifies or is intended to enhance or modify the physical or chemical characteristics of a control product to which it is added, and
(b) any active ingredient used for the manufacture of a control product."

1.6 The PMRA also sets maximum limits for pesticide residues on food, which are promulgated under the *Food and Drugs Act*. These are termed the "maximum residue limits" or "MRL" for short.

1.7 Provided the prescribed requirements are met, section 13 of the Pest Control Products Regulations requires registration of the pesticide under review. Section 18, however, stipulates that registration must be denied where, among other things, the use of the pesticide would lead to an "unacceptable risk of harm to human health, plants, animals or the environment." What constitutes an "unacceptable risk" is not defined in the Act or the regulations.

1.8 Risk management of registered pesticides is achieved primarily through setting conditions of use. Non-compliance with the conditions of use set out on the product label or with any other condition of registration is a violation of the Act and may lead to a suspension, cancellation, use restrictions or the phasing out of the pesticide.

1.9 The PMRA is responsible for monitoring compliance with the Act. It carries out this function through a network of regional offices and inspectors across the country, in co-operation with provincial and territorial governments and other federal departments. The Canadian Food Inspection Agency (CFIA), on the other hand, is responsible for verifying pesticide residue levels in foods at the point of sale to ensure that they do not exceed the maximum residue limits set by the PMRA. The CFIA is also responsible for inspecting pesticide content in other products, such as animal feed.

1.10 Any person who contravenes a provision of the Act or the regulations is guilty of an offence and liable on summary conviction to a fine not exceeding $50,000 or to imprisonment for a term not exceeding six months, or both. On conviction by indictment, a fine not exceeding $250,000 may be imposed, or imprisonment for a term not exceeding two years, or both.

2. THE NEED FOR NEW LEGISLATION

An Outdated Statute

2.1 The current *Pest Control Products Act* was passed by Parliament in 1969. Although the Act has been amended on several occasions since then, it has never been systematically revised. The Act's structure remains fundamentally unchanged from what it was 30 years ago: it is "framework" legislation that relegates to the regulations the important task of defining in greater detail the federal pesticide management regime in this country.

2.2 The need to update the Act has been recognized and advocated for years. In 1987, the Law Reform Commission of Canada,[3] as part of its "Protection of Life Series," issued a study paper on federal pesticide law and policy, which contained 23 detailed recommendations for change.[4] Shortly

[3] The Law Reform Commission of Canada was officially disbanded in 1993 as part of the budget cuts announced in 1992.

[4] J.F. Castrilli, and T. Vigod, *Pesticides in Canada: An Examination of Federal Law and Policy*, Protection of Life Series, prepared for the Law Reform Commission of Canada, the Law Reform Commission of Canada, 1987.

after, in 1989, the Honourable Don Mazankowski, Minister of Agriculture, created a multidisciplinary task force to make recommendations to improve the system. After close to two years of extensive negotiations and public consultations, this task force — the Pesticide Registration Review Team — issued a report in 1990. Known as the " Blue Book," this report recommended a complete overhaul of the system, notably, through the creation of the PMRA and the transfer of legislative authority from the Minister of Agriculture to the Minister of Health.[5]

2.3 As part of the Liberal Party of Canada's campaign promises, the Right Honourable Jean Chrétien, then Leader of the Official Opposition, pledged in 1993 to act on the Review Team's recommendations and introduce new federal pesticide legislation.[6] In a document released in October 1994, entitled *Government Proposal for the Pest Management Regulatory System* (known as the Purple Book), the newly-elected Liberal government outlined how it would implement the Pesticide Registration Review Team's recommendations. Several months later, on February 9, 1995, it officially announced the creation of the PMRA and the transfer of administrative responsibilities for the Act to the Minister of Health. It also pledged to introduce new legislation, following consultations with interested parties.[7]

2.4 Pursuant to this announcement, the PMRA was created in April 1995, and the Minister of Health was given administrative responsibility for the Act. It should be noted that these important changes came about through executive action. The PMRA was established "administratively" as a branch within Health Canada, whereas the transfer of legislative responsibility from the Minister of Agriculture and Agri-Food to the Minister of Health was effected by Order in Council issued on March 28, 1995.[8] The *Pest Control Products Act* was not itself amended to reflect these changes. Indeed, because an Order in Council rather than a legislative amendment was used to transfer legislative responsibility to the Minister of Health, the *Pest Control Products Act* continues to define "Minister" as the "Minister of Agriculture and Agri-Food."

2.5 The Committee is concerned that such fundamental changes to the federal pesticide management regime were effected without Parliament's input or approval. In the Committee's opinion, it would have been preferable had these changes been made through legislative action, following full and public debate.

2.6 The fact that the current *Pest Control Products Act* continues to refer to the "Minister of Agriculture and Agri-Food" rather than the "Minister of Health" underscores the need to bring forth a replacement bill at the earliest opportunity. More importantly, the Act must be upgraded to reflect the scientific advances and the fundamental shift in values and public policy that have taken place over the years.

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[5] Pesticide Registration Review Team, *Recommendations for a Revised Federal Pest Management Regulatory System, Final Report*, December 1990.

[6] Office of the Leader of the Opposition, "Liberals Announce Agriculture Policies," May 10, 1993.

[7] Government of Canada, "Government Reforms Pesticide Regulatory System," February 9, 1995.

[8] The Order in Council was issued under the authority of the federal *Public Service Rearrangement and Transfer of Duties Act.*

2.7 Noteworthy in this regard is the emergence of the concept of "sustainable development" which gained international prominence when adopted by the United Nations World Commission on Environment and Development in 1987 (better known as the Brundtland Commission).[9] The Brundtland Commission defined "sustainable development" to mean development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Commission also made the all important connection between environmental quality and human health.

2.8 The "precautionary principle" has also gained international recognition and is considered by many to be a key policy lever for promoting sustainable development. This principle has been enshrined in a number of international agreements, many of which have been ratified by Canada.[10] It essentially calls for precautionary action to be taken to avert harm, or potential harm, to the environment or human health, even in the face of scientific uncertainty. There is, however, no universally accepted definition for this principle and it has been defined differently under the various agreements.

2.9 Pollution prevention is a further principle that is viewed as an essential tool in achieving sustainable development. This principle focuses on avoiding the creation of pollutants in the first place, rather than trying to manage them after the fact. In 1995, the federal government expressly endorsed pollution prevention as the strategy of choice to protect human health and the environment.[11]

2.10 During her appearance before the Committee on November 2, 1999, Dr. Claire Franklin, Executive Director of the PMRA, stated that work was underway on the development of new legislation. She subsequently provided the Committee with a document entitled *Proposed Amendments to the Pest Control Products Act*. Prepared in January 1999, this document sets forth the amendments that the PMRA recommends be made to the Act.

2.11 The Minister of Health informed the Committee that he had no specific timeline for introducing new pesticide legislation in Parliament. He stated that before taking such action, he wanted to consult his caucus on the various issues and consider the recommendations of this Committee.[12]

2.12 The Committee is thankful to the Minister for postponing the introduction of a new bill until he has had the opportunity to consider our recommendations. There is little question, however, that legislative reform is long overdue and that time is of the essence. The current Act is 30 years old. It does little more than set out general prohibitions and provide broad regulatory authority. In the Committee's opinion, the current regulatory approach to pest management in Canada is no longer acceptable. It is essential that Parliament be involved in defining the elements of the new federal pest management regime.

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[9] World Commission on Environment and Development, *Our Common Future*, Oxford University Press, 1987.

[10] International agreements that refer to the precautionary principle include: Principle 15 of the 1992 Rio Declaration on Environment and Development; the 1992 Convention on Biological Diversity; the 1992 United Nations Framework Convention on Climate Change; the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (as amended in 1990); and the 1996 Protocol developed under the London (Dumping) Convention.

[11] Environment Canada, *Pollution Prevention, A Federal Strategy for Action*, 1995.

[12] *Evidence*, Meeting No. 23, February 17, 2000.

2.13 Many witnesses urged that the Act be modernized. The Committee agrees and recommends that new pesticide legislation be introduced at the earliest opportunity.

The Committee recommends that the Minister of Health introduce new pesticide legislation as a matter of top priority.

Guiding Principles for the New Legislation

2.14 The Committee has examined the package of amendments proposed by the PMRA in its January 1999 document.[13] As discussed in greater detail in this report, these proposed amendments are deficient in a number of material respects. In the Committee's opinion, the new legislation must clearly set out the guiding principles underpinning the revised regime. It must also provide a detailed framework for action that incorporates modern concepts of risk assessment and risk management. In particular, it must ensure that our most vulnerable populations, most notably children, are adequately protected.

2.15 Having regard to the evidence presented by the witnesses, the Committee believes the new legislation should be based on the following principles:

- the need to give absolute priority to the protection of human health and the environment in regard to pest management decisions;
- the need to ensure that a precautionary approach is taken in decision-making;
- the need to promote and increase reliance on pollution prevention strategies to eliminate or minimize the use of pesticides; and
- the need to foster public confidence by actively informing and involving Canadians.

2.16 When the PMRA was created in 1995, it was given a number of goals. One goal was to protect human health and the environment; another was to support the competitiveness of the agricultural, forestry and manufacturing sectors. In the Committee's opinion, the PMRA should not be in the business of supporting industry competitiveness. There are more appropriate departments within the federal government to carry out this task, including the Departments of Industry, Foreign Affairs and International Trade, Finance, Natural Resources and Agriculture and Agri-Food.

2.17 The Committee places great stock in the fact that the PMRA was created within Health Canada, rather than somewhere else. If this decision is to have any meaning, the protection of human health and the environment must become the Agency's central priority. As discussed in some detail in Chapters 5 to 7, pesticides are known to cause, or are suspected of causing, a wide range of illnesses and abnormalities in humans and wildlife. By definition, pesticides are toxic. It is thus essential that the protection of human health and the environment drive all pest management decisions, and this must be made clear in the new legislation, both in the preamble and the operative sections.

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[13] Pest Management Regulatory Agency, *Proposed Amendments to the Pest Control Products Act*, January 1999.

2.18 New generations of pesticides are constantly being introduced on the market to replace older pesticides. As science progresses, it is found that the newer pesticides, that we thought were less toxic, could be equally harmful to human health. Experience tells us that there is no such thing as a "harm-free" pesticide. In order to provide that margin of safety to compensate for lack of scientific certainty, it is critical that a precautionary approach be taken in all aspects of the decision-making process. The Committee, therefore, recommends that the new legislation enshrine the precautionary principle as one of its guiding principles.

2.19 Although there are many definitions of the precautionary principle, the Committee endorses the definition contained in the 1996 Protocol developed under the London Convention of 1972 respecting the disposal of substances at sea.[14] This definition provides a broader scope for action than many of the other definitions examined. If adjusted slightly to reflect a pesticide regulation context, the definition would provide that:

> Appropriate preventive measures are to be taken where there is reason to believe that a pesticide is likely to cause harm, even when there is no conclusive evidence to prove a causal relation between the pesticide and its effects.

2.20 As stated earlier in this Chapter, pollution prevention is considered an essential tool in achieving sustainable development. In the Committee's opinion, it is the option of choice in terms of protecting human health and the environment since it seeks to avoid or minimize the generation and use of pesticides and other pollutants, rather than managing the risks attendant upon their use. In the pesticide context, pollution prevention is achieved through the implementation of pesticide use reduction plans and integrated pest management strategies, which seek to either reduce or eliminate the use of pesticides. These approaches are discussed in Chapters 11 and 12.

2.21 In its 1995 pollution prevention strategy, the federal government called for a shift in emphasis from managing pollution to preventing it.[15] The Committee agrees with this new approach and recommends that the new Act also have, as a guiding principle, the promotion and increased reliance on pollution prevention strategies.

2.22 A further key principle, in the Committee's opinion, is the need to have an open and transparent process in order to foster public confidence in the pesticide regulatory regime. Canadians must be informed about the risks associated with pesticide use. They must also be provided with an opportunity to participate in the decision-making process. The more educated Canadians are about pesticide use, the greater the likelihood they will support, and call for the development and implementation of, alternative strategies. It is thus important that the new legislation emphasize the need to inform and involve Canadians.

2.23 The Committee wishes to stress that these principles must be enshrined not only in the preamble, but in the legislation's operative sections as well. This report makes a number of recommendations to "operationalize" these principles in specific areas. To ensure that these principles are given broad application, the Committee further recommends that they be codified in an

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[14] The 1996 Protocol under the London Convention was adopted on November 7, 1996. This Protocol is not yet in force. In order to come into force, it must be ratified by 26 countires, 15 of which must be Contracting Parties to the 1972 Convention. Four countries have signed, but not ratified the Protocol.

[15] Environment Canada, *Pollution Prevention, A Federal Strategy for Action*, 1995.

administrative clause similar to the one contained in section 2 of the new *Canadian Environmental Protection Act, 1999*.

The Committee recommends that the new Act be based on the following principles:

- **to protect human health and the environment as the absolute priority in all pest management decisions;**
- **to apply the precautionary principle;**
- **to promote and increase reliance on pollution prevention strategies in order to eliminate or minimize the use of pesticides; and**
- **to foster public confidence by actively informing and educating Canadians about pesticide use and by involving them in the decision-making process.**

The Committee recommends that these principles be enshrined in the new Act's preamble and its operative sections, notably, in an administrative clause similar to section 2 of the *Canadian Environmental Protection Act, 1999*.

The Committee recommends that the precautionary principle be defined as follows in the new Act:

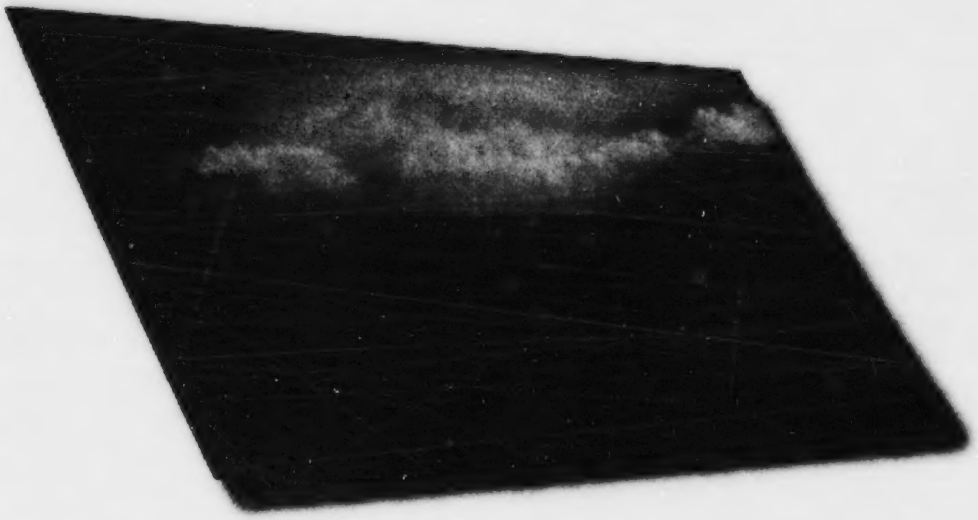
> **The precautionary principle means that appropriate preventive measures are to be taken where there is reason to believe that a pesticide is likely to cause harm, even when there is no conclusive evidence to prove a causal relation between the pesticide and its effects.**

2.24 The title of the current Act — the *Pest Control Products Act* — suggests that pesticide "products" are needed to control pests. This message, in the Committee's opinion, is erroneous and must be corrected. Because of their potential for harm, pesticides must be regarded as the measure of last resort, rather than the option of choice. This is the message that must be conveyed to Canadians. This report advocates a more comprehensive approach to pest management that is based on the principle of pollution prevention. It is important that this new direction be reflected in, rather than undermined by, the title of the new legislation. The reference to "products" must be deleted in the new legislation, for there are other, equally effective ways of controlling pests than through the use of pesticide "products."

The Committee recommends that the *Pest Control Products Act* be renamed the Pest Control Act.

PART B:

PESTICIDES AND THEIR HARMFUL EFFECTS



3. HISTORY OF PESTICIDE USE

The Main Classes of Chemical Pesticides

3.1 There is information to suggest that certain types of pest control products were used in Roman times, but the use of synthetics began in the 1930s and became more widespread after the end of World War II. Today, there are many categories of chemical pesticides being used in Canada, of which five principal classes are discussed in this chapter. Those in the **organochlorines** group were first used in the 1940s. From about 1945 to 1965, organochlorines were used extensively in all aspects of agriculture and forestry, in protecting wooden buildings and protecting humans from a wide variety of insect pests.

3.2 The discovery of a second more powerful group of insecticides, the **organophosphates**, led to the replacement of organochlorines and, in fact, many organchlorines are now banned in Canada[16]. Certain organophosphates are systemic: unlike non-systemic pesticides, they are taken up by the plant's tissues and the plant then inhibits or kills the bacteria, fungi or parasites.[17]

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[16] Environment Canada, Web site, "Waiting for the Fiddler, Pesticides and the Environment in the Atlantic Region," November 25, 1999.

[17] Encyclopedia Britannica, Web site, "History of Agriculture," November 15, 1999.

What are pest control products?

A *pest control product* is a product intended to control, destroy, attract or repel any pest, and includes chemicals, devices (such as pheromone traps) and even organisms (such as bacteria) (definitions from the *Pest Control Products Act*).

The word *pesticide* is more specific and includes herbicides, insecticides and fungicides, as well as algicides, insect and animal repellents, antimicrobial and cleaning products, wood and material preservatives, and insect and rodent traps.

Most pesticides are intentionally toxic to the target organisms. Pesticides are comprised of the "active" ingredients (the part with the pesticidal effect) and other ingredients such as surfactants, adjuvants, etc. used to augment the effects of the active ingredient. These, too, can be harmful to human health or the environment. (1999 Report of the Commissioner of the Environment and Sustainable Development, Exhibit 3.4).

3.3 **Carbamate** insecticides came into use later than both the organochlorines and the organophosphates and are less widely used than the others. Their use is diverse; some are used extensively for forest protection, while others are widely used against insect pests of potatoes and grains. The synthetic **pyrethroid** group of insecticides was introduced more recently, in the early 1970s, although natural source pyrethrum has been used for hundreds of years. Synthetic pyrethroids are more stable to light and possess a higher insecticidal activity, almost ten times that of most organophosphates and carbamate insecticides. The stability and activity of the synthetic pyrethroids are reflected in their increased use during the last two decades on fruits, vegetables and corn. The high insecticidal activities of these chemicals allow relatively small amounts to be applied (about 100 grams/hectare).[18]

3.4 Although most of the groups mentioned above are insecticides, two of the best-known pesticides, 2,4-D and 2,4,5-T, are phenoxy herbicides. In fact, 2,4-D was the first successful semi-selective herbicide to be developed. After 50 years of use, products containing 2,4-D still account for one-quarter of all pesticides used in Canada.[19] Fungicides are also used in Canada, and account for about 60% of total agricultural pesticide use in the Atlantic region.[20] In addition to the main chemical groups dealt with above, there are many other pesticides on the market, such as aldehydes, amides, pyridil, isoxazol and others, which are not discussed in this report.

Sectors of Pesticide Use

3.5 There are more than 7,000 pesticides registered in Canada.[21] According to information from the Crop Protection Institute of Canada provided to the Committee by the Urban Pest Management Council of Canada, industry sales for 1997 totalled $1,429,887,000; herbicides alone account for 85% of the market (Figure 3.1). There are no data on total product sales in Canada, as there is no national database of pesticide sales. Still, the data compiled by the Crop Protection Institute following a survey of its members paints an overall picture of the pesticide market based on sales. Figure 3.2 shows a breakdown of total sales (agricultural and non-agricultural) of pesticides by province. The highest

[18] US Geological Survey, Web site, November 1999.

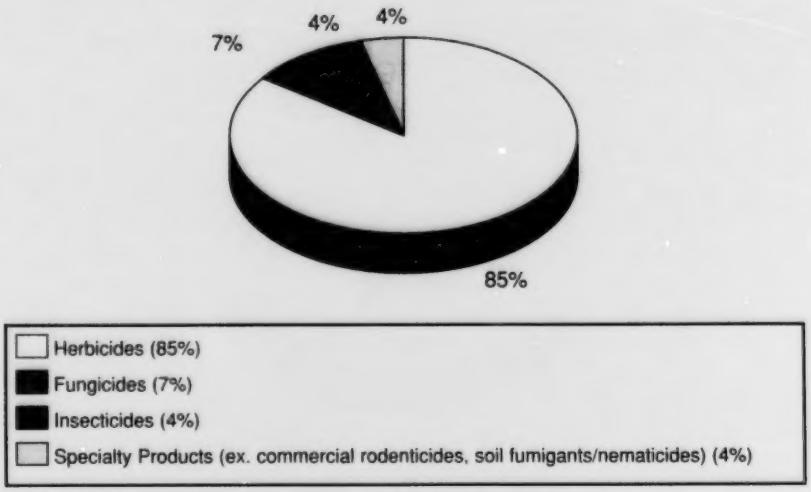
[19] Environment Canada, Web site, "Waiting for the Fiddler, Pesticides and the Environment in the Atlantic Region," November, 1999.

[20] Environment Canada, Web site, "Waiting for the Fiddler, Pesticides and the Environment in the Atlantic Region," November, 1999.

[21] World Wildlife Fund, The Problem with Pesticides in Canada: A Briefing Book for Parliamentarians, April 1999.

sales were in Saskatchewan (36%), Alberta and British Columbia combined (24%), Manitoba (18%) and Ontario (16%) (Figure 3.2).

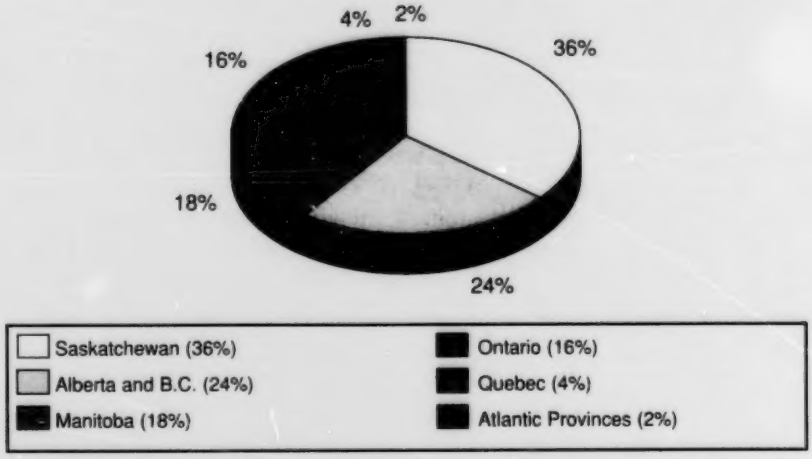
Figure 3.1: 1997 Total Sales by Pesticide Group (%)



Source : Crop Protection Institute. 1998 Sales Survey Pest Control Product in Canada, Report and Discussion, Web site, February 2000.

Note : The 1998 Survey included members only. Data are not directly comparable to previous years for all categories.

Figure 3.2 : 1997 Total Pesticide Sales by Province (%)

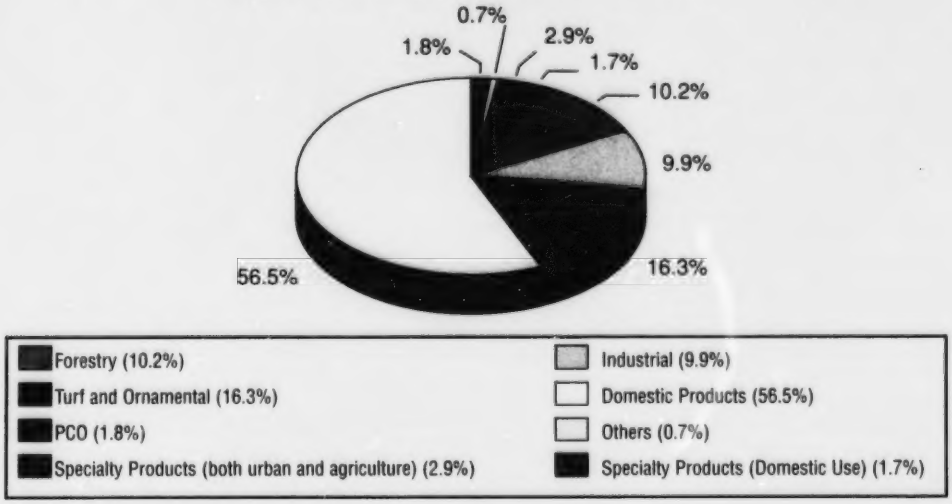


Source : Crop Protection Institute. 1998 Sales Survey Pest Control Product in Canada, Report and Discussion, Web site Internet, February 2000.

Note : The 1998 Survey included members only. Data are not directly comparable to previous years for all categories.

Most pesticides are used for agricultural purposes (agriculture accounts for 91% of sales), while non-agricultural pest management products represent 9% of sales. In the non-agricultural sector, sales of pesticides for domestic use represent a surprisingly high proportion of profits at 56%, while the forestry and industrial sectors each had sales accounting for about 10% of the market (Figure 3.3).[22]

Figure 3.3 : 1997 Pesticide Sales (%) for Non-Agricultural Uses (representing 9% of total sales)



At one time, pesticides were used almost exclusively for agricultural purposes, but these data suggest that people now consider that pesticides are essential for beautifying the landscape. Urban-dwellers and golf course managers use considerable amounts of pesticides (Appendix 3.1). Sales of non-agricultural pest management products totalled $121 million in 1997.

General Characteristics of Pesticides

3.6 Over and above the fact that pesticides are manufactured and intended to be toxic, each pesticide has different chemical and physical characteristics; biological and physical factors influencing toxicity are too numerous to warrant meaningful conclusions in any but the most general terms. Criteria such as toxicity, solubility, degradation, volatility, biotransformation or accumulation vary from one pesticide to the next. Appendix 3.2 describes these characteristics in terms of five of the chemical pesticide categories mentioned above. Pesticide transport in the environment is dealt with in the following chapter, while the toxic effects of pesticides are examined in Chapters 5, 6 and 7.

[22] Urban Pest Management Council of Canada, Brief to the Committee.

Appendix 3.1
Pesticides and Golf Courses

There are two approaches to pesticide use on golf courses, preventative and curative applications with curative being the most common approach. Pesticides that are used on golf courses fall into three categories: insecticides, herbicides and fungicides. Insecticides are used to a lesser extent than either herbicides or fungicides. Herbicides, if used for two to three consecutive years, can pretty well eliminate most weeds of concern. Fungicides are used because fungal pathogens can cause severe loss of grass on a golf course.

It should be noted that present day golf course managers are licensed pesticide applicators and are often university /college graduates.[23]

Most commonly used active ingredients (products) within each category of pesticide:

Insecticides: diazinon, chlorpyrifos and carbaryl

Herbicides: 2,4-D (mixtures such as Killex); mecoprop, and dicamba

Fungicides: quintozene; iprodione (Rovral); and chlorothalonil (Daconil)[24]

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[23] Doug Rothwell, Compliance and Regional Operations Subdivision, Pest Management Regulatory Agency, pers. comm., January 2000.

[24] Pam Charbonneau, Turfgrass Specialist, Ontario Ministry of Agriculture, Food and Rural Affairs, pers. comm., January 2000.

Appendix 3.2: Description of Major Groups of Chemical Pesticides

Class of Chemical Pesticides	First Used	Examples	Types	Current Status	Effects
Organochlorines	1942	aldrin; chlordane; dieldrin; endrin; heptachlor; lindane; methoxychlor; toxaphene; hexachlorobenzene (HCB); pentachlorophenol (PCP); DDT	insecticide, acaricide, HCB & PCP are fungicides	Lindane, methoxychlor and pentachlorophenol are registered in Canada. The other products have been discontinued in Canada, but they are still used in developing nations	Persistent, bioaccumulative, affect the ability to reproduce, develop, and to withstand environmental stress by depressing the nervous, endocrine and immune systems
Organophosphates	Very early 1940s	schradan; parathion; malathion	insecticide, acaricide	Schradan was discontinued in 1964 and resulted in a move toward less toxic groups (e.g. malathion, parathion)	Non-persistent, systemic (cholinesterase-inhibiting), not very selective, toxic to human
Carbamates	First appeared in 1930 but large-scale use in mid-1950s	carbaryl; methomyl; propoxur; aldicarb	fungicide, insecticide, acaricide	Aldicarb was discontinued in 1964; the others are registered in Canada Although carbamates share a mode of action with the organophosphates, their effects are reversible and they are biotransformed in-vivo	Non-persistent, cholinesterase-inhibiting, not very selective, toxic to birds and fish
Phenoxy	Large-scale marketing and distribution began in 1946	2,4-D 2,4,5-T	herbicide	2,4-D is widely used 2,4,5-T banned in Canada	Selective effects on humans and mammals are not well known 2,4-D: potential to cause cancer in laboratory animals 2,4,5-T: is the source of a toxic contaminant – dioxin
Pyrethroids	1980	fenpropanthrin; deltamethrin; cypermethrin	insecticide	Fenpropanthrin is not registered in Canada, unlike the two other pesticides	Target-specific: more selective than the organophosphates or carbamates, generally not acutely toxic to birds or mammals but particularly toxic to aquatic species

A compilation of data from : Amdur, M.O., Doull, J. and C.D. Klaassen, *Casarett and Doull's Toxicology: The Basic Science of Poisons*, Fourth Edition, Pergamon Press, 1991; Encyclopedia Britannica, Web Site, "History of Agriculture," November 1999; Environment Canada, Web Site, "Waiting for the Fiddler, Pesticides and the Environment in the Atlantic Region," November 1999; Environment Canada, Web Site, "Pesticides and Wild Birds," Canadian Wildlife Service, Web Site, Hinterland Who's Who, November 1999; U.S. Geological Survey, Web Site, November 1999; Pest Management Regulatory Agency, pers. com., Jan. and Feb. 2000.

Tessa MacIntosh

4. PESTICIDES IN THE ENVIRONMENT

Transportation and Dispersion of Pesticides in Soil, Air and Water

4.1 Pesticides are released into the environment through human activities. They may contribute to point source pollution and area source pollution. A point source of pollution is a source such as an urban water collection system outfall which discharges pesticide-contaminated water at a specific location. An area source, for example, is one which discharges earth contaminated by pesticides into the aquatic environment. Agricultural area pollution is the greatest and most problematic source of pollution in aquatic environments in Canada. Once in the environment, certain pesticides break down relatively quickly, whereas others persist over longer periods of time and can accumulate or transform into contaminant by-products. In addition to movement through soil, pesticides can be mobilized by precipitation and wind.

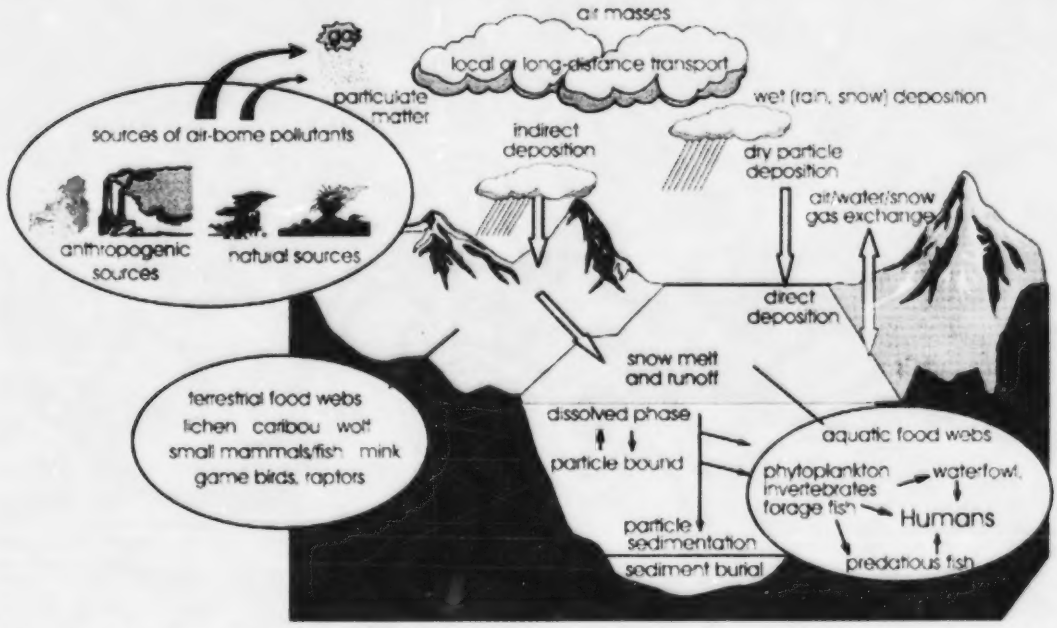
4.2 Committee members learned from the testimony of Dr. Bernard Hill[25] a scientist with Agriculture and Agri-Food Canada's Lethbridge Research Centre, that precipitation helps pesticides disperse far from their source through the natural phenomena of water evaporation and condensation. A study conducted in Alberta in 1998 showed that large quantities of the herbicide 2,4-D were found

[25] Dr. Bernard Hill et al., *Phenoxy Herbicides in Alberta Rainfall: Cause for Concern?* Poster, unpub. Agriculture and Agri-Food Canada.

in precipitation in that region, even though that product breaks down quickly in the presence of oxygen. Researchers developed a number of hypotheses to explain this phenomenon which is specific to the Lethbridge area. They believe that the presence of pesticides in rain reflects the fact that Lethbridge farmers are among the greatest 2,4-D users in Alberta (more than 20,000 kg of 2,4-D is applied for grain production annually).[26] These findings also suggest that, apart from the abundance and duration of rain, pesticide concentrations in rain vary with factors such as land use, time of year and a region's economic profile.

4.3 Some pesticides are carried by wind in the form of vapour, particles or droplets, which enable them to be transported long distances from their source. Precipitation deposits these contaminants on the ground or in waterways where they may accumulate and/or transform. Figure 4.1 illustrates a typical path taken by certain pesticides in the environment. The contaminants are then absorbed by plant life and enter the food chain where they become concentrated in animal fat.

Figure 4.1: Pesticide Transportation in the Environment



Source: Indian and Northern Affairs Canada, *Canadian Arctic Contaminants Assessment Report*, Northern Contaminants Program, 1997.

Long-Range Transportation of Pesticides: Persistent Organic Pollutants (POPs)

4.4 According to information provided by the Inuit Circumpolar Conference and the Inuit Tapirisat of Canada, 80% of pollutants detected in the Arctic (the territory north of the 60th parallel, which in fact covers the arctic and subarctic regions) appears to come from countries other than

[26] Ibid.

Canada.[27] Through a cycle of long-range transportation, combined with specific physical and chemical characteristics, the wind carries some pesticides and POPs[28] as far as the Arctic.[29] The Committee learned that POPs — chemicals found in the environment as a result of human activities — have three characteristics: they are semi-volatile, persistent and fat-soluble. They are semi-volatile, readily moving from the solid to the gaseous state at high temperatures and back to the solid state at cold temperatures. These pesticides, used in more southerly regions, partially evaporate, are carried by winds, then condense under the effect of cold Arctic air and are deposited on the ground. When pollutants reach the North they tend to accumulate; cool temperatures prevent them from evaporating again. POPs can repeat this cycle a number of times and over long distances in a series of "hops," which led to the process being termed the "grasshopper effect" (Figure 4.2). POPs are persistent because they resist degradation under normal environmental conditions.

Figure 4.2: The Grasshopper Effect

THE GRASSHOPPER EFFECT AND OUT-OF-CANADA SOURCES
Source Regions for Agricultural and Industrial Contaminants
Agricultural
Industrial
Dominant Air Currents
Atlantic Water Circulation
River discharge
Alpha-HCH in seawater ng/litre
Concentrations of one HCH compound have been found to increase from south-to-north along a line from the Java Sea (off Indonesia and China) to the Beaufort Sea (AMAP, 1997).
0
3000Km

POPs, when released into the environment, can be transported on air currents to places far from their point of origin. Such transport can consist of a number of "hops" from one point to another. Each "hop" consists of three stages: evaporation, transport in the atmosphere and condensation at lower temperatures. Scientists have called this phenomenon the "**grasshopper effect**." Because evaporation is minimal in colder regions, POPs tend to build up in arctic and mountain ecosystems.

POPs can travel long distances in a matter of days or weeks on air currents, and more slowly in water. Ocean currents, air currents and rivers which funnel agricultural runoff and industrial discharges to the ocean are important POPs transport pathways.

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[27] Inuit Circumpolar Conference and Inuit Tapirisat of Canada, Brief to the Committee.

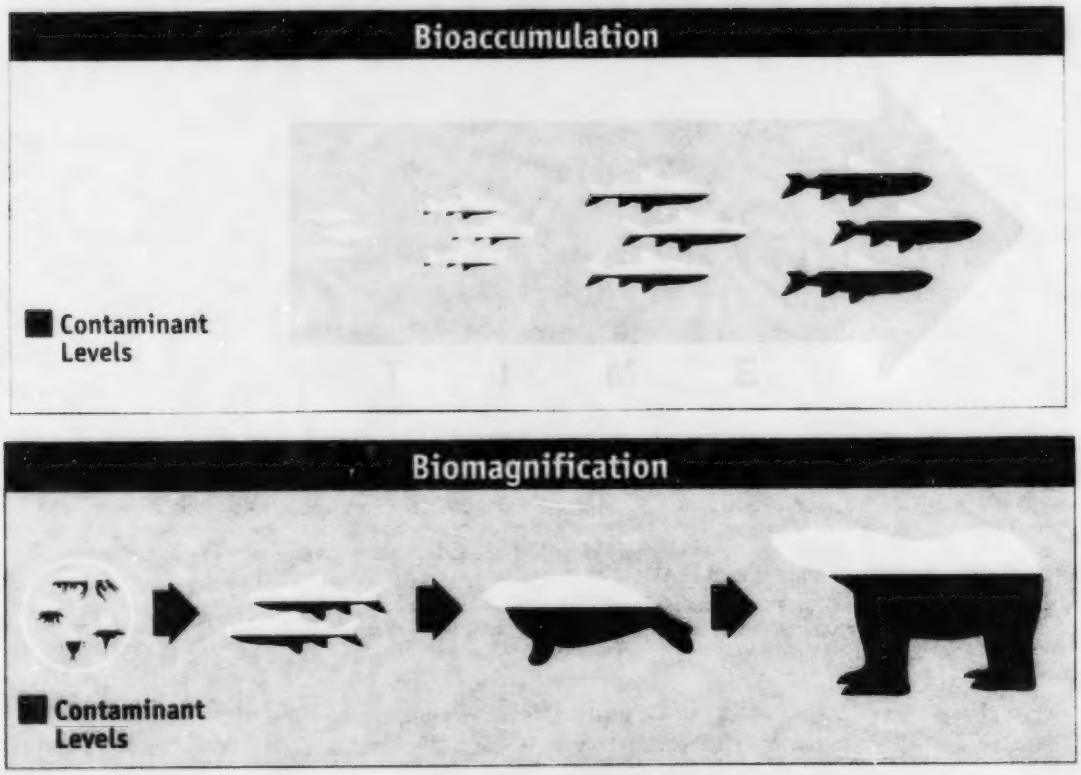
[28] In 1998, Canada signed international agreements on 16 POPs, 11 of which are pesticides. The 16 POPs now subject to international action are: *Pesticides:* chlordane, DDT, aldrine, dieldrine, endrine, heptachlore, hexachlorobenzene, mirex, chlordecone, lindane, toxaphene; *Industrial Chemicals:* PCBs, hexabromobiphenyl; *Contaminants* (by-products): dioxins, furans, polycyclic aromatic hydrocarbons (PAHs).

[29] J. Jensen, K. Adare and R. Shearer, *Canadian Arctic Contaminants Assessment Report*, Northern Contaminants Program, Indian and Northern Affairs Canada, 508 p., 1997.

4.5 POPs are fat-soluble but are nearly water-insoluble and therefore living organisms cannot excrete them, hence, they accumulate them in their tissues. Bioaccumulation is the term to describe this process whereby toxic substances collect in the living tissues of an organism over a period of time. As organisms continue to eat plants or animals that are contaminated, contaminants continue to accumulate, and the concentration of contaminants increases as materials pass up the trophic levels of the food chain. This is known as biomagnification (Figure 4.3). POPs are known to biomagnify. As Dr. David Stone, Director, Northern Science and Contaminants Research Directorate, of Indian and Northern Affairs Canada explained to the Committee:

> First of all, the organochlorine pesticides that we're worried about are called persistent organic pollutants because they share the characteristic of being persistent. They resist degradation in normal environmental conditions. They are semi-volatile, and this is a very important characteristic. It means that they cannot basically decide whether they want to be a solid, a fluid, or a gas. As you'll remember from your chemistry, that is always temperature dependent. So at warm temperatures these substances will enter the atmosphere; at cold temperatures they'll come down to the ground.
>
> Finally, they are fat soluble and have a very low water-solubility. Our bodies are designed to get rid of pollutants that they don't like by converting them into water-soluble substances that we excrete in our urine. For fat-soluble substances, that mechanism doesn't work and they tend to build up over a lifetime. In the food chain, that means you can get quite extraordinary concentrations at high levels in the food chain.[30]

Figure 4.3: Bioaccumulation and Biomagnification



Source: J. Jensen, K. Adare and R. Shearer, Canadian Arctic Contaminants Assessment Report, Northern Contaminants Program, Indian and Northern Affairs, 508 p., 1997; Draft report, 1999 EcoSummit.

[30] *Evidence*, Meeting No. 16, December 14, 1999.

4.6 POPs detected in samples in the Arctic from 1991 to 1997[31] included the pesticides listed in Table 4.1, all of which are organochlorines. It should also be noted that all the pesticides listed as "Discontinued" have been classified under Track 1 of the federal Toxic Substances Management Policy (TSMP), which means that they are persistent, bioaccumulative, toxic and primarily the result of human activity, and will thus be targeted for virtual elimination from the environment.[32] It has also been observed that three pesticides detected in samples are still registered in Canada: endosulfan, methoxychlor and trifiuralin. Lindane, a hexachlorocyclohexane, is still registered in Canada but for limited use.

Table 4.1: Pesticides Detected in Arctic Samples under the Northern Contaminants Program*

Pesticide	Discontinued	Not Registered	Registered	Track 1, TSMP[33]
Aldrine	√			√
Chlordane	√			√
DDT	√			√
Dieldrin	√			√
Endrin	√			√
Heptachlor	√			√
Hexachlorobenzene	√			√
Hexachlorocyclohexane			Some pesticides (lindane) still in use	
Mirex		√		√
Toxaphene	√			√
Endosulfan			√	
Methoxychlor			√	
Trifluralin			√	

LEGEND

Discontinued: The company has voluntarily taken the product off the market. Although a company may subsequently try to re-register a product in accordance with present requirements, according to the Pest Management Regulatory Agency (PMRA) the chances of a discontinued product becoming re-registered are small.

Registered: Registered by the PMRA

Not registered: Because of the *Access to Information Act*, it is impossible to tell whether "Not Registered" means that a product did not pass the tests, or that no application was made for it.

* Personal communications with the PMRA; and Indian and Northern Affairs Canada presentation on pesticide residue in the Canadian Arctic and the TSMP, December 9, 1999.

[31] The Northern Contaminants Program, which made this study possible, is described in Chapter 7, "Other Vulnerable Population Groups." In addition to the pesticides listed here, the following POPs have been detected in the Arctic: hexabromobiphenyl, PAHs, PCBs, dioxins, and furans.

[32] Chapter 9 entitled "Risk Management" describes the TSMP.

[33] As of May 2000, the following substances, although not pesticides, are also found under Track 1: polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, PCBs.

As Table 4.1 indicates, some highly persistent organochlorines are no longer used in Canada, but they are still detected in the arctic environment. Although use of these pesticides is prohibited or limited in Canada, they are manufactured and used in a number of other countries, and the fact that they are readily volatilized leaves the entire Canadian Arctic vulnerable to contamination through long range atmospheric transport.[34] POPs are detected not only in the Arctic, but also in high concentrations in the Great Lakes basin and the St. Lawrence River.

Increasing Levels of Pesticides in the Urban Environment

4.7 Although most pesticides in Canada are used by the agricultural sector, which is the primary source of pollution in most aquatic ecosystems, urban populations contribute significantly to the presence of pollutants in the environment. The Committee heard from a number of groups familiar with pesticide use in cities, such as the Campaign for Pesticide Reduction, the Working Group on the Health Dangers of the Urban Use of Pesticides, Nature-Action Québec and the Federation of Canadian Municipalities. It would appear from the testimony of one of these groups, the Canadian Water and Wastewater Association, that pesticides are sometimes used to a greater degree in cities than in farming operations. The Association reported the findings of an American survey which revealed that lawn treatment with pesticides in Chicago averaged 9 kilograms per hectare per year compared to 2 kilograms per hectare per year for soya bean farmers.[35] According to the Federation of Canadian Municipalities, the situation is no better in Canada where, it appears, two-thirds of Canadian households use pesticides. Half of these homeowners apply the products themselves, often without protection, an average of three times a year.[36]

U.S. Numbers

In the United States, at least 80% of the population uses pesticides at home: 57% use them to control weeds; 50% to eliminate pet parasites; 12% retain the services of lawn maintenance companies and 20% use pesticides inside their homes. (Sierra Club of Canada, Brief to the Committee).

4.8 The Federation of Canadian Municipalities reported to the Committee that 1.3 million kilograms of pesticides had been used in urban areas in Ontario in 1993. This figure, which does not even reflect quantities used by citizens, is equal to one-quarter of the total amount used for agricultural purposes.[37] Nature-Action Québec reported that pesticide sales are still increasing in Quebec (15.2% since 1995).[38] Apart from pesticide use on public lands and by individuals, the maintenance of golf courses and of rights-of-ways for electrical power lines, water and gas lines and railways also contribute to urban pollution.

4.9 Witnesses expressed serious doubt about the appropriateness of using such large quantities of pesticides in the urban environment. In their view, urban pesticide use to improve the appearance of

[34] J. Eetoolook, Acting President, Nunavut Tunngavik Inc., Brief to the Committee.
[35] Canadian Water and Wastewater Association, Brief to the Committee.
[36] Federation of Canadian Municipalities, Brief to the Committee.
[37] Ibid., Brief to the Committee.
[38] Nature-Action Québec, Brief to the Committee.

lawns, gardens and public parks is non-essential. Nature-Action Québec explained the phenomenon as follows:

> Enormous amounts of pesticides are used on lawns in an attempt to maintain this kind of monoculture which creates conditions that attract pests. In addition, consumers are massively influenced by pesticide sellers who have large budgets to convince people they need to have perfect lawns.[39]

A recent Environment Canada study on pesticides in the urban environment clearly illustrates the problem of urban pesticide contamination. In 1998, a team from the Ecosystem Health Division took samples from two streams in Toronto and three stormwater holding ponds in Guelph in order to determine the degree of water pollution from pesticides used in the urban environment. On the basis of the study, the researchers reached the following conclusions about heavy urban pesticide use: herbicides (2,4-D, MCPP) and insecticides (diazinon, chlorpyrifos) are often found immediately after periods of rain; similar pollution patterns can be observed in the Toronto, Hamilton and Guelph urban areas and detected quantities of diazinon and chlorpyrifos exceed established water quality objectives.[40]

4.10 Witnesses emphasized that pesticides are a constant threat to people. Pest control products used near houses filter into homes and likely persist longer than they do outdoors, where they are broken down more quickly by environmental media.

4.11 Based on this testimony, the Committee feels that urban pesticide use is as important an issue as agricultural utilization. Consequently, urban areas must form an integral part of a proper pesticide management system in Canada.

Pesticides in the Aquatic Environment

4.12 During the Committee's hearings, the issue of water contamination in natural and urban areas emerged as one of the major current issues. A number of groups, in particular the Canadian Water and Wastewater Association, the Learning Disabilities Association of Canada, the Canadian Public Health Association, the World Wildlife Fund, and the Sierra Club of Canada, testified that drinking water is subject to extensive pesticide exposure through contact with the air, water run-off and precipitation. These problems add to the increasing pressures brought to bear on the water resource in recent decades by pollution growth, agricultural, industrial and commercial development and growing water demand.

4.13 According to the Canadian Water and Wastewater Association, pesticide contamination of drinking water is a real problem. Although concentrations did not exceed recommended Canadian standards, pesticide residues were detected in wells by government monitoring teams across the country.[41] Samples taken in Quebec have shown that 30% of Quebec drinking water systems inspected

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[39] Ibid.

[40] J. Struger and B. Ripley, Pesticide Concentrations in Urban Aquatic Environments, Poster presentation, Ecosystem Health Division, Environment Canada; Laboratory Services Division, University of Guelph; Industrial Waste and Stormwater Quality Unit, Toronto Works and Emergency Services, 1999.

[41] Canadian Water and Wastewater Association, Brief to the Committee.

between 1989 and 1994 contained residues of the herbicide atrazine or its metabolites.[42] Atrazine is one of the pesticides most frequently found in surface and groundwater in Quebec, Ontario, British Columbia, Nova Scotia and Saskatchewan. In Prince Edward Island, where agriculture is intensive, Health Canada observed in 1985 and 1986 that the pesticide aldicarb was present in 80% of samples and that certain concentrations exceeded recommended standards for drinking water. Aldicarb and its metabolites are highly persistent in groundwater. Also in P.E.I., evidence of water contamination was observed on eight separate occasions in 1999.[43]

4.14 The Canadian Water and Wastewater Association is particularly concerned about the impact of pesticides on municipal water and wastewater treatment. Although current technologies can lower pesticide concentrations in water to acceptable levels, the increased presence of contaminants could eventually require a change in water treatment processes, which would entail high costs and, according to the Association, would produce not particularly satisfactory results. The Association believes that Canada's drinking water protection system must be reassessed in view of the increasingly strong pressures placed on the resource. The Association advocates the development of government pesticide reduction initiatives.

4.15 In its testimony, the Learning Disabilities Association of Canada deplored the fact that unlike in the United States, there is no systematic control of water quality in this country. It is, therefore, impossible to study the population's total exposure to pesticides although evidence of their presence in water exists:

> A number of pesticides have been shown to be present in well water. There is a U.S. pesticides and groundwater database, and it reviews data from over 68,000 wells in 45 states. Pesticides were found in more than 16,000 of these wells in 42 states. Nearly 10,000 of these wells had concentrations greater than EPA drinking water standards.
>
> The only survey Mr. Shantora [Director General, Toxics Pollution Prevention Directorate, Environment Canada] knew of — the Ontario Well Water Survey in 1998 — found atrazine in one sample to be at 210 parts per billion which is 40 times the Canadian guideline of 5 parts per billion for atrazine. And atrazine is again being found in 30% of samples of rainwater in Europe.[44]

4.16 Committee members are seriously concerned about the impact of pesticides on the quality of ground and surface water in Canada, and feel that the issue of water safety and management must be addressed by government. The reduction of pesticide use appears to be an increasingly important objective based on the evidence presented to the Committee.

4.17 In addition to urban environments and aquatic systems, the Committee heard varying figures for pesticide application in Canada's forest. These figures range from 200,000 hectares sprayed with insecticides in 1998,[45] to 12 million hectares sprayed with pesticides (Bt) during the last spruce

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[42] Government of Quebec, Water Quality Report for the period from 1989 to 1994. Cited in the Canadian Water and Wastewater Association, Brief to the Committee.

[43] Dead fish in rivers believed to have been contaminated by pesticides such as the insecticide azinphos-methyl have been observed, among other places, in the Valleyfield and Souris rivers according to the Canadian Water and Wastewater Association.

[44] *Evidence*, Meeting No. 4, November 16, 1999.

[45] *Evidence*, Meeting No. 127, June 2, 1999.

budworm outbreak[46]. Given the dependence of Aboriginal peoples on hunting, gathering and fishing for their subsistence, a precautionary approach to pesticide applications in the environment on which these people rely is necessary.

Selected Pesticide Uses

Pentachlorophenol is exclusively used as a preservative on telephone poles. This pesticide contains small quantities of dioxins and furans, which Environment Canada considers toxic.

Acrolein is a herbicide approved for use in irrigation ditches. Although acrolein use might constitute the discharge of a toxic substance in a fish habitat, the application of this product in irrigation ditches is permitted even though the *Fisheries Act* prohibits the discharge of substances harmful to fish unless authorized by regulation.

Environmental Research Programs

4.18 The federal departments with research programs on pesticides in the environment (Agriculture and Agri-food, Environment, Natural Resources, Health, and Fisheries and Oceans) have established various research initiatives. Environment Canada concentrates its research on surface water and contaminants affecting wildlife, while Agriculture and Agri-Food Canada analyzes groundwater and waterways in agricultural areas.[47]

> Agriculture and Agri-Food Canada (AAFC) also carries out major research projects using agro-environmental indicators. These indicators make it possible to evaluate trends and environmental changes caused by agricultural activities. Two studies, on soil and air, have been produced since 1993; the study on water should be available shortly.[48]

Natural Resources Canada carries out research mainly on integrated forest pest management. (See Chapter 11, "Alternatives to Pesticides".)

4.19 The research work done by Fisheries and Oceans Canada (DFO) supplements that of Environment Canada, which is responsible for administering and enforcing the pollution prevention provisions under section 36 of the *Fisheries Act*. DFO has a national environmental sciences program and thus takes part in research on the impact of pesticides on fish and fish habitats. As part of this work, Environment Canada and Fisheries and Oceans Canada have established a link between pesticides used in forest environments and their impact on fisheries. Dr. Ron Pierce of the Environmental Science Branch, DFO, stated:

> The studies we have done so far have demonstrated that there is a linkage between the use of the material in the pesticide formulations and reductions in Atlantic salmon populations, particularly in the sports fisheries. We are continuing that study. The results of this stage are relatively preliminary. We are just funding a new three-year study to look at the actual causal relationships between the carrying agents in the pesticides formulations and possible effects on juvenile Atlantic salmon.[49]

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[46] Ibid.

[47] *Evidence*, Meeting No. 128, June 8, 1999.

[48] Ibid.

[49] Ibid.

4.20 Future studies will help to assess more thoroughly the causal relationships between pesticides and aquatic environments. However, Dr. Pierce informed the Committee that budget cuts and the departure of experienced researchers had undermined the department's scientific resources and that this situation affected all scientific departments.[50] The Committee is aware of this problem and feels it must be resolved in view of the need for sound scientific information as a tool for good pesticide management. Chapter 17 presents a detailed look at the inadequacy of funding for environmental research in a discussion of the budget of the Pest Management Regulatory Agency.

4.21 These research projects are a vital source of information on the presence and effects of pesticides in the environment. The Committee feels that government research projects provide an invaluable tool for sound pesticide management, and that it is important to ensure that this information is used effectively. The organizations responsible for conducting research cannot work in isolation, but must co-operate and exchange information harmoniously and effectively. Committee members deplore the budget cuts made to the research programs in scientific departments and ask the government to make the necessary resources available to them.

The Committee urges the government to substantially increase funding for research on and monitoring of the effects of pesticides in the environment, in order to protect human health and the environment.

[50] Ibid.

5. POTENTIAL EFFECTS OF PESTICIDES ON HEALTH

5.1 The scientific research that describes the impact of pesticides on wildlife suggests that pesticides affect reproduction, growth, neurological development, behaviour and the functioning of the immune and endocrine systems.[51] While these studies have generally been done on animals exposed to higher concentrations than those to which humans are in fact exposed, the experts use their findings to extrapolate effects on humans since it is difficult, even impossible to demonstrate what effects pesticides have on human beings. The wildlife toxicity data has shown that the young (at pre- and post-natal stages of growth) tend to exhibit greater sensitivity to pesticides, and that pesticide effects may manifest themselves later in life and may even be transmitted from generation to generation. The potential effects of the main chemical groups of pesticides are described in this Chapter using examples of toxicity data involving animals.

[51] Canadian Environmental Law Association, *Draft — Regulating Pesticides to Protect Children's Health*, 94 p., December 1, 1999; Environment Canada Web site, "Endocrine Disrupting Substances in the Environment," January, 2000.

Acute and Chronic Effects

5.2 Exposure to pesticides can cause acute or chronic effects on health. Acute (or short-term) effects generally occur immediately after heavy exposure to pesticides, and are well-documented. Work by Dr. Pierre Mineau, a researcher with Environment Canada's Canadian Wildlife Service, has shown that an insecticide can kill instantly. Some insecticides used in granular form, such as carbofuran and terbufos, are highly toxic to birds that ingest them as dietary grit. Dr. Mineau told the Committee that a single granule of carbofuran[52] can be instantly lethal to a small bird. For terbufos, the kill rate is about 50%.[53]

5.3 A chronic effect develops over a long period of time, and may last for several years after initial exposure. The effect may be related to long-term or repeated exposure to a pesticide at a low dosage, or to exposure to a high dosage for a short time. Chronic health effects typically include cancer, interference with the development of the fetus and child, and disruption of the reproductive, endocrine, immune and/or central nervous systems (neurotoxic effects).[54] There is controversy surrounding the identification of many chronic effects of pesticide exposure, because of inconsistencies in the research, contradictions among existing studies, and because of data gaps. It is difficult, therefore, to demonstrate a conclusive link between pesticides and certain illnesses, as was pointed out to the Committee by Dr. Kelly Martin of the Canadian Association of Physicians for the Environment:

> When you review the evidence, there's a huge mishmash. There are probably 300 studies out there looking at all different outcomes in humans, but it's difficult to link with pesticides, to try to break it down into what they've been exposed to. You have to account for smoking and drinking and all the other things, which you can do in studies.[55]

Despite the confounding factors in these studies, the witness believes that the potential for serious impact on human health is cause for concern. While the evidence may be limited, the hypotheses developed by the scientific community are of sufficient concern that they warrant further investigation. Dr. Martin added:

> I would say there's concern. There's limited evidence, and there's quite a lot of concern over that. It's not like leukaemia and lymphoma, for which we have reasonably good evidence to act on. Breast cancer is the other big concern with pesticides.[56]

Dr. Merryl Hammond, founder of Action Chelsea for the Respect of the Environment also expressed her concerns to the Committee:

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[52] The granular form of carbofuran is banned in Canada.

[53] *Evidence*, Meeting No. 12, December 2, 1999.

[54] M. Butterfield and D. Rosenberg, *Exposure: Environmental Links to Breast Cancer*, film screening, Ottawa, October 1998; M. Gilbertson, "Linking Water Quality to Wildlife and Human Health," *Focus*, International Joint Commission, November 1998, p.18-19; G.W. Chance and E. Harmsen, "Children Are Different: Environmental Contaminants and Child Health," *Canadian Public Health Review*, Volume 89, Supplement 1, May/June 1998, p. 10-14; A. Pernille, P. Grandjean, T. Jorgensen, J.W. Brock, H.B. Hartvig, "Organochlorine exposure and risk of breast cancer," *Lancet*, 352(9143), 1998, p. 1816-1820.

[55] *Evidence*, Meeting No. 11, December 1, 1999.

[56] Ibid.

> Many studies published in prestigious, peer-reviewed medical and epidemiological journals and reports point to strong associations between chemical pesticides and serious health consequences, including—and I'll just read this list briefly—endocrine disruption and fertility problems, birth defects, brain tumours and brain cancer, breast cancer, prostate cancer, childhood leukaemia, cancer clusters in communities, gastric or stomach cancer, learning disabilities, non-Hodgkin's lymphoma, canine malignant lymphoma, and various acute effects. [...] [57]

The Effects of Organochlorines

Well known organochlorines: aldrin, chlordane, DDT, dieldrin, lindane, mirex, toxaphene.

5.4 In the course of its proceedings, the Committee learned that although pesticides in the same group will likely cause the same types of effects (appendix 3.2), each pesticide must be studied individually, because it can have effects that vary according to its inherent characteristics. Let us look first at the organochlorines which share three properties: persistence, liposolubility and volatility. These substances do not generally decompose easily in the environment and, because of their high fat-solubility, have a tendency to accumulate in the tissues of certain species of mammals. Contaminants can thus reach high concentrations in the tissues of predators, who are high on the food chain. This phenomenon is known as biomagnification. In Canada, the double-crested cormorant, a predator that eats fish, is used as a national indicator of persistent organochlorine levels because of its broad distribution across southern Canada, especially in areas of concentrated human activity.[58] While most of the more persistent and bioaccumulative organochlorines were banned in North America and Europe over 20 years ago, some persistent organochlorines are still used in developing countries because they are cheap and effective against disease-bearing insects. Wind and water bring them to Canada, where they have been found in human breast milk.[59]

5.5 Organochlorines are also responsible for reduced fertility in birds and thinning of egg-shells. The Committee learned from witnesses that organochlorines are suspected of aggravating certain chronic health problems in humans such as cancer, weakened immune systems and the disruption of hormonal functions. The following organizations raised this concern: World Wildlife Fund, Canadian Institute of Child Health, Learning Disabilities Association of Canada, Canadian Public Health Association, Sierra Club of Canada, Canadian Environmental Defence Fund, Ontario College of Family Physicians, Canadian Environmental Law Association, Canadian Association of Physicians for the Environment, and the Inuit Circumpolar Conference.

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[57] *Evidence*, Meeting No. 10, November 30, 1999.

[58] Environment Canada, Web site, "Persistent organochlorines," *S and E Bulletin*, January 1998.

[59] S.A. Briggs, *Basic Guide to Pesticides: Their Characteristics and Hazards*, Rachel Carson Council, 1992, 283 p.

Effects on Health of a Persistent, Bioaccumulative Pesticide*

An organochlorine insecticide, dieldrin was introduced in the 1950s. In Canada, it was used in forestry and agriculture, and for both domestic and industrial purposes. Dieldrin use was restricted in the early 1970s when its effects on health were first noted, and it is not registered now. Even though it is no longer used in a number of countries, dieldrin's persistence in the environment has led scientists to study its long-term health effects. A substance with a half-life of 182 days is considered persistent: dieldrin's half-life is estimated to be between 182 days and 7 years.

In addition to the insecticide's impact following acute or short-term exposure, dieldrin is suspected of causing serious chronic effects:

- Dieldrin mimics naturally occurring hormones and interferes with the hormone or endocrine system.
- Some scientists have noted a synergistic effect when dieldrin is mixed with other pesticides: for instance, chlordane increases dieldrin's hormone disrupting potential.
- Like other endocrine disruptors, dieldrin may be involved in the development of breast cancer.
- Dieldrin may affect the central nervous system and the liver.

* Summary prepared on the basis of scientific articles cited in this report.

The Effects of Organophosphates and Carbamates

Well known organophosphates: chlorpyrifos, diazinon, glyphosate, and malathion.
Well known carbamates: carbofuran, aldicarb, and carbaryl.

5.6 Organophosphates and carbamates, unlike their predecessors the organochlorines, have a relatively short half-life in the environment. Many of these products, which include fungicides and herbicides as well as insecticides, act on a very broad spectrum. In other words, they kill non-target species as well as target species. This characteristic has a negative effect on the food chain and on wildlife habitats, and consequently there is an indirect impact on species that eat certain prey or use the affected habitats. Organophosphates and carbamates, products that are very common today, are identified by their function: they are *cholinesterase inhibitors*.[60] This means that they kill by interfering with an enzyme that is vital for nerve transmission. In Canada, of approximately 30 approved pesticides that can poison wild birds, most are organophosphates and carbamates.[61] While there are advantages to their low level of persistence in the environment, it also means that they need to be applied more than once during the growing season, and this increases the danger of wildlife exposure. Mammals are much better than birds at detoxifying organophosphates and carbamates. For example, birds are 100 times more sensitive than mammals to the common insecticide diazinon.[62] In terms of impact on human health, it is believed that organophosphate compounds inhibit the enzymes that are essential for the proper functioning of the central nervous system, causing dizziness and

[60] With the exception of glyphosate.
[61] Environment Canada, Web site, "Pesticides and Wild Birds," Canadian Wildlife Service, Hinterland Who's Who, November 1999.
[62] Ibid.

sometimes convulsions that may lead to death.[63] A number of chronic effects of carbamate exposure have also been reported, including lowered sperm counts, reduced fertility and lower haemoglobin.[64]

The Effects of Phenoxy Herbicides and Pyrethroids

Well known phenoxy herbicides: 2,4-D, 2,4,5-T, dichlorprop, mecoprop
Well known pyrethroids: cypermethrin, deltamethrin

5.7 While the effects of phenoxy herbicides on plants are well known, their effects on mammals are poorly understood. It is suspected that this group of pesticides stimulates cancer development, delays fetal development, and promotes mutations and other problems,[65] but few studies have been carried out. It has also been reported that intense exposure to these herbicides can affect the peripheral nervous system, although studies using laboratory animals have not been able to demonstrate this phenomenon.[66]

5.8 Synthetic pyrethroids inhibit the conduction of certain minerals across the nerve cell membrane in parasites and block the transmission of nerve impulses. The effects of synthetic pyrethroids on humans are still very poorly understood,[67] but some sources note, at most, that these pesticides can cause irritations.[68] Pyrethroids are often combined with other active ingredients.

5.9 The Committee is aware of the confounding factors which limit scientific research on chronic effects of pesticides on human health. Research conducted on wildlife is valuable since it provides an indication of potential risks to human health. In addition, the Committee learned that there are gaps even in studies on mammals; for example, little is known about the effect of phenoxy herbicides on mammals or the long-term effects of synthetic pyrethroids. These gaps suggest that there may be other gaps in our knowledge of the effects of other chemical groups of pesticides as well. The Committee is concerned about the health of Canadians and the environment and, from this perspective, urges the government to encourage this kind of research, which is essential to a better understanding of the pesticide effects.

The Committee recommends that the government fund research on those chemical groups of pesticides whose action and chronic effects on human health are still relatively unknown, such as synthetic pyrethroids and phenoxy herbicides.

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[63] Canadian Institute of Child Health, Brief to the Committee; Canadian Public Health Association, Brief to the Committee.

[64] S.A. Briggs, *Basic Guide to Pesticides: Their Characteristics and Hazards*, Rachel Carson Council, 1992, 283 p.

[65] Ibid.

[66] Toronto Public Health Environmental Protection Office, *Pesticides: A Public Health Perspective*, Technical Report, October 1998.

[67] U.S. Geological Survey, Web site, November 1999.

[68] University of Nebraska, Web site, Pesticide Education Resources, February 2000.

Endocrine Disruptors

5.10 The subject of endocrine disruptors was raised repeatedly during the Committee's hearings. Certain artificial substances may cause changes to the hormone or endocrine system; they are referred to as *endocrine disruptors*. By disrupting hormone secretion, endocrine disruptors cause physiological imbalances. In humans, for example, obesity, diabetes and bone decalcification can be consequences of this kind of hormonal imbalance. Endocrine disruptors fall into the following three categories:

> 1) mimics, which set off the same chemical reactions as natural hormones and are recognized by the body as if they actually were hormones;
>
> 2) blockers, which prevent naturally-produced hormones from entering cells by "locking up" the cell receptors; and
>
> 3) triggers, which set off cell reactions that would not normally be produced by hormones.[69]

5.11 A number of pesticides are on the list of chemical substances suspected of having effects on the hormone system, prepared by the American Endocrine Disrupter Resource Center (EDRC), that was established by the US Institute for Agriculture and Trade Policy (IATP) (see Appendix 5.1: List of Known and Suspected Endocrine Disruptors). Half of the substances shown on that list are part of the organochlorine group. According to this organization, even minute concentrations (parts/trillion) of these products in the human body would be enough to affect the endocrine system. At this point in time, scientists are divided on the extent of this problem. Most believe that more intensive research is essential if we are to have a proper understanding of the endocrine disruptor phenomenon. Some believe that most of the substances studied seem to have at least a low impact on mammals (including humans). Others think that the effects of endocrine disrupting chemicals are seen mainly in the fetus and in developing children. Still others suggest that the scope of effects may vary depending on a host of parameters.

5.12 On this point, the World Wildlife Fund believes that the more research is done on endocrine disruptors, the more scientists realize the extent of the health problems for which these products are probably responsible:

> Approximately 60% of the poundage of contemporary-use pesticides — these would be agricultural pesticides — used in the United States, which compares almost identically with the list of pesticides used in Canada, are known endocrine disruptors [...]. The evidence for these statistics comes from peer-reviewed scientific literature and government reports. The list is continuing to expand as new research is published.[70]

Pesticides suspected of acting as endocrine disruptors appear to be linked to the development of breast, prostate and testicular cancers, endometriosis, abnormal sexual development, lowered male fertility, damage to the thyroid and pituitary glands, lowered immunity, and behavioural problems. A Canadian study published in the *Canadian Medical Association Journal* suggested pollution was one of the main causes of the average annual 2% increase in testicular cancer (60% over the past 30 years)

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[69] The Endocrine Disrupter Resource Center, Web site, January 1999.

[70] *Evidence*, Meeting No. 5, November 17, 1999.

noted in 1999.[71] The results of another study indicate that growing children and fetal development are particularly vulnerable to pesticides.[72] Dr. Kelly Martin stated:

> ... endocrine disruption is a big problem. In animal studies, it's well shown that you don't have the development of a penis, or you get something that's somewhere between the penis and the clitoris in animals when they're exposed to pesticides. In kids, we know we have increased rates of cryptorchidism, in which you don't have descent of the testes and you don't have normal sperm counts. We know we have that in society in general. It's a very big problem, but to link it to these things is very difficult. We haven't had the money, so the studies haven't been done. But certainly in animal studies it has been a very big concern, and there's a big push from a lot of people to get more human evidence on this.[73]

Research on Endocrine Disruptors

5.13 In Canada, under the new *Canadian Environmental Protection Act, 1999*, the government must do research on substances that disrupt the hormone system.[74] An interdepartmental working group is focusing on endocrine disruptors; it is composed of representatives from five federal departments: Natural Resources, Environment, Fisheries and Oceans, Agriculture and Agri-Food and Health. About $2.5 million per year has been allocated for research on endocrine disruptors, both inside the government and in the academic sector.[75] Dr. Theo Colborn reminded the Committee that Canada pioneered research into endocrine disrupters, thanks in particular to the Canadian Wildlife Service, whose research has demonstrated the phenomenon of endocrine system disruption in wildlife. These results blazed the trail for the international scientific community, which today is studying the question of active compounds in the environment as they affect the human population. Dr. Colborn stressed that Canada should continue investing in this type of research.[76] She was critical, however, of the fact that despite this evidence, there is still no protocol for precisely detecting the effects of endocrine disruptors on fetal growth.

5.14 The Committee is very concerned by the lack of financial resources apparent from the testimony heard. Apart from the general problem of budget cuts for environmental research (including research programs on POPs, discussed in Chapter 4) wildlife research in general has also been a victim of inadequate resources. This problem was raised by Dr. Pierre Mineau:

> Finding the evidence of a bird kill involves large, intensive, systematic surveys and searches of the areas that have been treated, as well as a number of chemical and biochemical analyses. The cost of these operations is actually beyond the resources of the Canadian Wildlife Service. We're talking here of studies that may cost anywhere from $125,000 right up to possibly $1 million—and that's for every use pattern.[77]

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[71] B. Evenson, "More Men Suffer Testicular Cancer: Something Strange is Going On," *National Post*, January 26, 1999, p. A1.

[72] Toronto Public Health Environmental Protection Office, *Pesticides: A Public Health Perspective*, Technical Report, October 30, 1998.

[73] *Evidence*, Meeting No. 11, December 1, 1999.

[74] Environment Canada, Web site, "New Funding to Implement the New *Canadian Environmental Protection Act*," September 14, 1999; Environment Canada, Web site, "The *Canadian Environmental Protection Act* : A Strengthened *Act* for the New Millennium," September 14, 1999.

[75] *Evidence*, Meeting No. 2, November 2, 1999.

[76] *Evidence*, Meeting No. 5, November 17, 1999.

[77] *Evidence*, Meeting No. 12, December 2, 1999.

5.15 The Committee shares the concerns expressed by witnesses about the absence of a specific protocol and about reduced financial resources, and urges the government to maintain its research programs and provide them with adequate long-term funding.

The Committee recommends that the government strengthen its research programs on endocrine disruptors, particularly by providing adequate, permanent funding for: (1) carrying out research on wildlife and (2) developing a specific protocol for detecting the effects of endocrine disruptors on human health.

APPENDIX 5.1

List of Known & Suspected Hormone Disruptors

Pollutants with Widespread Distribution Reported to have Reproductive and Endocrine-Disrupting Effects

Persistent Organohalogens

Dioxins and furans
PCBs
PBBs
Octachlorostyrene
Hexachlorobenzene
Pentachlorophenol

Pesticides

2,4,5-T
2,4-D
alachlor
aldicarb
amitrole
atrazine
benomyl
beta-HCH
carbaryl
chlordane
cypermethrin
DBCP
DDT
DDT metabolites
dicofol
dieldrin
endosulfan
esfenvalerate
ethylparathion
fenvalerate
lindane
heptachlor
h-epoxide
kelthane
kepone
malathion
mancozeb
maneb
methomyl
methoxychlor
metiram
metribuzin
mirex
nitrofen
oxychlordane
permethrin
synthetic
pyrethroids
toxaphene
transnonachlor
tributyltin oxide
trifluralin
vinclozolin
zineb
ziram

Penta- to Nonyl-Phenols

Bisphenol A

Phthalates

Di-ethylhexyl phthalate (DEHP)
Butyl benzyl phthalate (BBP)
Di-n-butyl phthalate (DBP)
Di-n-pentyl phthalate (DPP)
Di-hexyl phthalate (DHP)
Di-propyl phthalate (DprP)
Dicyclohexyl phthalate (DCHP)
Diethyl phthalate (DEP)

Styrene dimers and trimers

Benzo(a)pyrene

Heavy Metals

Cadmium
Lead
Mercury

Pollutants with Widespread Distribution Reported to Bind to Hormone Receptors and therefore Suspected to have Reproductive and Endocrine-disrupting Effects

2,4-dichlorophenol
Diethylhexyl adipate
Benzophenone
N-butyl benzene
4-nitrotoluene

NOTES

This list of substances considered to have endocrine disrupting and reproductive effects is compiled from a variety of sources including:

- Colborn, T. and C. Clement (1992) Chemically Induced Alterations in Sexual and Functional Development: The Wildlife/Human Connection. Princeton, NJ: Princeton Scientific Publishing.

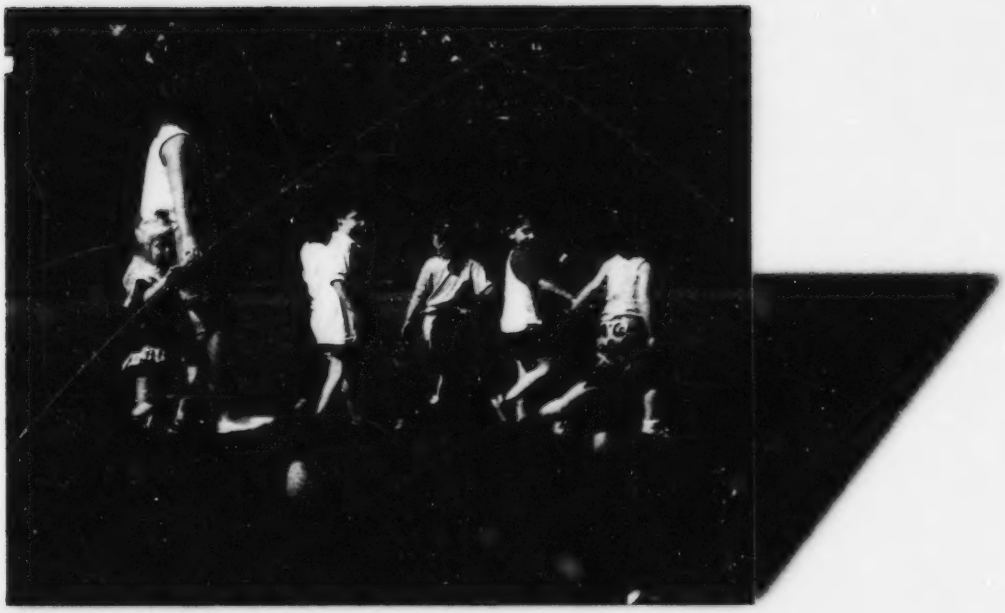
- Colborn, T., F. von Saal and A.M. Soto. (1993) Developmental Effects of Endocrine-Disrupting Chemicals in Wildlife and Humans. Environmental Health Perspectives, Vol. 101, Number 5.

- Lyons, G. (1995) Phthalates in the Environment. World Wildlife Fund UK.

- Ministry of Agriculture, Fisheries and Food. (1995) Effects of Trace Organics on Fish, Phase II, Foundation for Water Research, UK.

All of the substances presently identified as hormone disruptors are now widely distributed throughout the environment, some are common constituents of consumer products, and many are now found in human tissues.

Source: The Endocrine Disrupter Resource Center, Web site, January 1999.



6. VULNERABILITY OF CHILDREN

Threat to Child Health

6.1 Most of the public health and environmental protection organizations received by the Committee, in particular the Canadian Institute of Child Health, the Learning Disabilities Association of Canada, the World Wildlife Fund, the Canadian Environmental Law Association and the Ontario College of Family Physicians denounced the Canadian pesticide management system because it does not specifically address the vulnerability of children, and emphasized the importance of correcting this deficiency. In the view of the Canadian Institute of Child Health, "most regulations and policies are designed to protect adults and refer to the healthy 70-kilogram male, and not the 7-kilogram child."[78] Officials from the Pest Management Regulatory Agency dispute this statement indicating that this is not the case at present. To demonstrate the urgent need to pay specific attention to children, witnesses from public health and environmental protection organizations explained how children, from conception to adolescence, are more vulnerable to pesticides than adults. See Chapter 8 for a description of the way in which risks are assessed by the Pest Management Regulatory Agency.

[78] Canadian Institute of Child Health, Brief to the Committee.

Why Children are Particularly Vulnerable

Physiological Development and Daily Activities

6.2 Children are vulnerable in part because they run a greater risk of exposure to pesticides due to the specific characteristics of their development and physiology. For example, they eat more food, drink more water and breathe more air per kilogram of body weight than adults and can thus absorb larger quantities of the pollutants present in the environment.

6.3 In addition, their diets are appreciably different from those of adults (consisting largely of fruits, vegetables and mother's milk), and the younger they are, the more limited their ability to metabolize and eliminate residual toxic substances.[79] As mentioned by Sandra Schwartz of the Canadian Institute of Child Health:

> From conception to adolescence, children are more sensitive and more exposed to pesticides than the average adult. On average, children receive greater exposures to pesticides because kilogram for kilogram they eat more food, drink more water, and breathe more air than adults, and their diets are somewhat different from those of adults, particularly at a young age.[80]

6.4 Children have different habits (for instance, more exploratory behaviour, more frequent outdoor activities) which expose them to pollutants to a greater degree than adults. Table 6.1, prepared by the Canadian Environmental Law Association, provides a list of sources of exposure to which children are specifically subject. For example, residues of domestic pesticides used to control ants and rodents can accumulate in at-home play areas, public parks and school playgrounds. Flea collars worn by pets, and pesticides stored in cupboards are just a few of the many sources of exposure at home that could be eliminated by parents if they were informed of the risks associated with pesticides. There are also many other sources of exposure, such as public play structures made out of wood that has been treated with a preservative, swimming pool chemicals, and the pesticides used on turf in playgrounds. Chapter 12, entitled "Awareness, Reduction and Phase Out," discusses in greater depth the need to inform the Canadian public and proposes recommendations related to this goal.

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[79] Anonymous, "How safe is your produce, *Consumer Reports*," March 1999.

[80] *Evidence*, Meeting No. 4, November 16, 1999.

Table 6.1: Sources of Exposure Relevant to Children

1. The Home (in the child's home & homes of playmates)	**Applications of pesticides** • Indoor commercial application of pesticides to control rodents, cockroaches, ants, termites, earwigs, etc. • Homeowner/resident use of insecticide sprays, strips, baits • Application of insect repellents directly on skin or scalp (e.g. personal bug sprays, shampoos for lice, scabies) • Collars or powders to treat household pets for fleas, ticks, etc. • Commercial application of lawn and garden insecticides, herbicides and fungicides • Insecticides, herbicides and fungicides used in the garden or on the lawn by the homeowner or resident **Storage and handling of pesticides** • Storage of household pesticides in areas accessible to children • Disposal of pesticides in household garbage **Pesticide life cycle and pathways** • Pesticide residues in house dust and in soil tracked in from outdoors • Pesticide residues on furniture, drapes, toys, pet fur, absorbent items
2. Public Places (schools, daycare, etc.)	• Commercial applications of pesticides for rodents, cockroaches, termites, etc. • Storage of pesticides in areas accessible to children • Disposal of pesticides and pesticide containers in regular school garbage • Commercial applications of pesticides to maintain playgrounds, playing fields • Wood preservatives on play structures • Pesticide application in other public places, e.g. airplanes, restaurants, malls, offices, etc.

3. Via Air & Water	• Pesticides in indoor air (from uses above for household and public places)
	• Pesticides in outdoor air
	  • Pesticide drift from spraying (agricultural, municipal, household)
	  • Long range transport of persistent pesticides (e.g. DDT)
	• Pesticides in drinking water — treated tap water or well water
	• Pesticides in swimming water — lake and river sediments, algicides in swimming pools

4. Via Food	• Food crops that are routinely sprayed and form a significant part of juvenile diet, e.g. fruits, vegetable, grains • Foods prepared from agricultural products, e.g. baby foods • Bioaccumulation in other animals and their products e.g. meat, fish, eggs, dairy products • Mother's intake and body burden transferred across placenta • Mother's intake and body burden transferred to breast milk

Source: Canadian Environmental Law Association, Draft — *Regulating Pesticides to Protect Children's Health*, 94 p., December 1, 1999.

Vulnerability of the Fetus and the Infant

6.5 Research suggests that exposure to chemical pollutants acting as hormone disruptors can affect the development of the fetus and the child. Witnesses underline that from the moment of conception, the fetus comes into contact with pollutants from the mother's body that pass through the placenta.[81] Pesticides can be absorbed by a fetus through the placenta, the skin and the lungs. The respiratory movements made by the fetus cause the substances in the amniotic fluid to reach the air tubes, especially if the fetus is under stress.[82] Ms. Sandra Schwartz of the Canadian Institute of Child Health stated:

> Pesticides can be transferred from a mother's body to a developing fetus or embryo. For example, ...concentrations of Lindane and DDE have been found in amniotic fluid.[83]

A newborn's nutrient intake is enormous: during the early years, caloric requirements per unit of weight are five times higher than for an adult.[84] These requirements can be met exclusively by breast milk, but this important food may expose the newborn to contaminants. According to Dr. Nicole Bruinsma of the Canadian Public Health Association, women accumulate contaminants in their bodies and excrete them in breast milk thus subsequently passing them on to the newborn. The most dangerous contaminants for the child are those which affect brain development because of the brain's rapid growth at this stage.

> Breast milk now is the most contaminated food that humans can eat, because it presents a food that is at the very top of the food chain. It's more concentrated than anything we're exposed to because it's already been concentrated one more time in our bodies. And that's the first food we're putting into the mouths of our infants when they're coming out of the womb, at the moment of birth, at a moment when their vulnerabilities are maximal.[85]

Effects on Children's Health

6.6 The Committee is deeply concerned that organochlorines and other insecticides can disrupt the endocrine system and have repercussions on fetal development (an indirect effect), and that contaminants can affect children directly at very early stages of development by damaging the nervous system, by affecting behaviour and by interfering with the immune system and the reproductive organs. The various stages in the development of the embryo, the fetus and the child are controlled by specific chemical messengers that are programmed to emerge at a particular site in the body and be accepted at another, at a precise concentration and at a specific time. If another chemical interferes with these messengers, it may cause irreversible damage at any one of these stages. The result may be seen in development and in the functioning of the reproductive system which may unleash a myriad of problems.

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[81] S. Schwartz and G.W. Chance, "Children First," *Alternatives Journal*, 25(3):20-25, Summer 1999.

[82] G.W. Chance and E. Harmsen, "Children Are Different: Environmental Contaminants and Child Health," *Canadian Public Health Review*, Volume 89, Supplement 1, May/June 1998, p. 10-14.

[83] *Evidence*, Meeting No. 4, November 16, 1999.

[84] G.W. Chance and E. Harmsen, "Children Are Different: Environmental Contaminants and Child Health," *Canadian Public Health Review*, Volume 89, Supplement 1, May/June 1998, p. 10-14.

[85] *Evidence*, Meeting No. 4, November 16, 1999.

6.7 Studies conducted in the United States in the area of children's health have highlighted the fact that the main illnesses currently affecting children are chronic in nature. The mortality rate from asthma and the rate of hypospadias (a birth defect in which the opening of the urethra is on the underside of the penis rather than on the tip) have doubled, cases of leukemia and brain cancer have increased, and neurological developmental problems have spread.[86] It is also suspected that other long-term problems result from exposure to pesticides, such as non-Hodgkin's lymphoma and reproductive organ tumours.[87] During the hearings, attention was given to a possible link between the parents' place of work (families living in agricultural areas, for instance) and an increased rate of childhood cancer and birth defects.[88] Dr. Colborn of the World Wildlife Fund, and Ms. McElgunn, of the Learning Disabilities Association of Canada, also put forward the hypothesis that pesticides might have negative effects on behaviour, due to the effects on neurological development:

> [...] a study was done in Mexico recently by Dr. Elizabeth Gillette, who looked at children between the ages of four and five. One group was exposed to many pesticides because of farm and home use, and the others who lived in the foothills had virtually no pesticide exposure at all. There were very significant differences between the two groups in both mental and motor abilities. The children from the farm areas were scoring at a much lower level. They had an increase in aggressive behaviour as compared to the matched pesticide-free children living in the foothills. Their play was more likely to be very solitary, and it did not show much play-pretend and that type of thing.[89]

Research into Child Vulnerability

6.8 The testimony and the scientific literature have led Committee members to the conclusion that children are the most vulnerable group affected by pesticides. However, there appear to be no research programs focusing on this specific group in Canada. For example, there is no child or fetus pollution indicator system which would make it possible to gather data on concentrations of pollutants found in children's bodies. The testimony of Dr. Martin also suggests that little research has been done in this field:

> With regard to neurological effects ... we see kids all the time who after using it either as an insect repellent or for head lice will have seizures and prolonged confusion. That happens all the time. We think that's just an acute effect ... Over the long term what does that do? If you can have that effect from putting insect repellent on your infant's head, what happens to your neurological system after 15 years of exposure? We need to be studying it, and we need to be funding the studying of it.[90]

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[86] P.J. Landrigan, et al., "Children's Health and the Environment : a New Agenda for Prevention Research," *Environmental Health Perspectives 106*, Supplement No. 3, 1998.

[87] G.W. Chance and E. Harmsen, "Children Are Different: Environmental Contaminants and Child Health," *Canadian Public Health Review*, Volume 89, Supplement 1, May/June 1998, p. 10-14.

[88] Sierra Club of Canada, November 17, 1999, V.F.Garry et al, "Pesticide Appliers, Biocides, and Birth Defects in Rural Minnesota," *Environmental Health Perspectives*, Volume 104, No. 4, April 1996, p. 394-399.

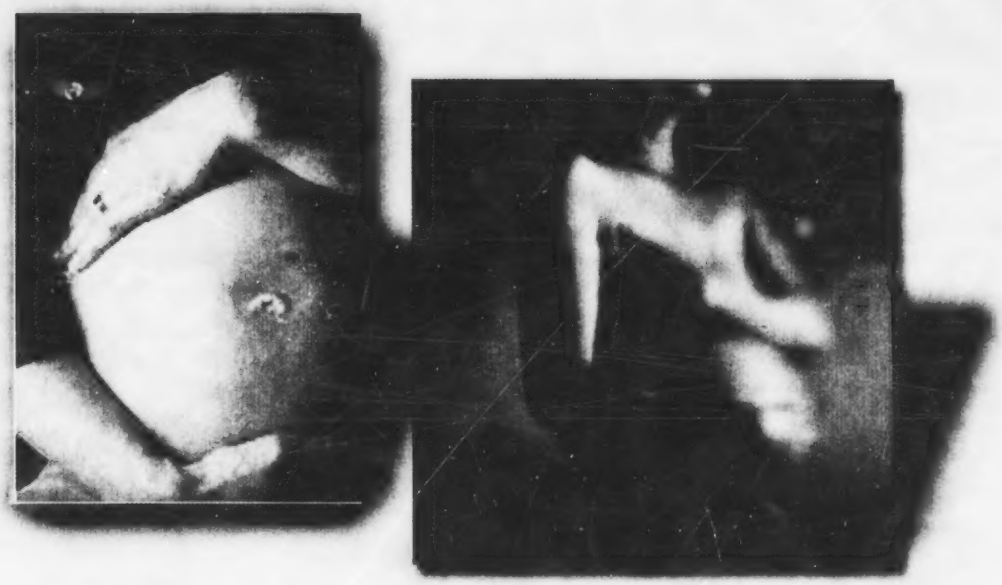
[89] *Evidence*, Meeting No. 4, November 16, 1999.

[90] *Evidence*, Meeting No. 11, December 1, 1999.

6.9 Children, for many reasons, make up the group that is the most vulnerable to pesticides, because of their developmental and physiological characteristics, their daily activities which are different from those of adults and the fact that the fetus and the newborn are exposed to pollutants accumulated in the mother's body. Current research programs in Canada do not take these specificities into account and the information available to the general public is inadequate.

6.10 The Committee urges the federal government to develop an area of research specifically for children. Research protocols should focus on the effects of pesticides on children specifically. Additional funding will be necessary to achieve this objective.

The Committee recommends that the government immediately develop and ensure adequate funding for a pesticides research program devoted specifically to child health. Research goals should focus on the exposure of the fetus and the newborn to pollutants accumulated in the mother's body, on the neurotoxic effects of pesticides and on such aspects as children's daily activities and their developmental and physiological characteristics.



7. OTHER VULNERABLE GROUPS

Vulnerable Groups

7.1 The entire population is vulnerable to contaminants circulating in the environment, but to varying degrees. Geography has an influence on the level of the risk to which the public is exposed. Researchers have shown that pollution is high in the basins of the Great Lakes and the Saint Lawrence River where most Canadians live. Because of the grasshopper effect and the characteristics of certain substances, contaminants also accumulate in Canada's North. The literature provided by the witnesses indicates that three categories of the population are especially vulnerable to the presence of pesticides. In the first group are women and children who, because of their body types, are more sensitive to contaminants. The second group comprises people in poor health (including older people), who are likely to have reduced defences against chemical stresses. The portion of the population in more frequent contact with pesticides makes up the third group, which includes workers who handle pesticides on the job and people who live in areas where pollutants accumulate, and who also fish, hunt and collect fruit to feed themselves.

Reasons for Vulnerability Factors

Characteristics of the Female Body Type

7.2 The preceding Chapter showed how children's bodies are particularly sensitive to pesticides, which in the opinion of the members of the Committee makes them the most vulnerable population group. Women, whose bodies contain greater proportions of fatty tissue, are more likely to accumulate persistent organic pollutants (POPs). Some researchers assume on the basis of this fact that women exposed to pesticides may run a higher risk of developing breast cancer.[91] The Sierra Club of Canada stressed the vulnerability of women examined in several studies, including one begun in Windsor in 1995 on the occupational backgrounds of 1,000 people suffering from cancer. This study showed that women living in a farm setting displayed a high rate of pre-menopausal breast cancer.[92] Although a number of studies were cited in support of this hypothesis, it remains difficult, even impossible, to link breast cancer directly with pesticides. A study carried out in Hawaii in 1997, for example, suggests that volcanic soil and acid rain can aggravate the effects caused by pesticide contamination of drinking water and ground water by dieldrin.[93] According to Dr. Kelly Martin, a member of the Canadian Association of Physicians for the Environment who appeared before the Committee on December 1, 1999, a host of parameters can influence the impact of contaminants, making it almost impossible to demonstrate a cause-and-effect relationship. This does not prevent the Association from fearing that pesticides are indeed causing, among other things, breast cancer among women.

People in Poor Health

7.3 People who suffer from asthma or allergies, people with multiple chemical sensitivity (MCS) and older people make up a second vulnerable group. According to information available on the Internet site of the Nova Scotia Environmental Health Centre, a group that treats and researches environmental sensitivity problems, some people can have more violent reactions following contact with pesticides than other people who are in better health. For example, people with MCS can suffer a wide of range of symptoms including burning eyes, breathing problems, muscular weakness, headaches, fatigue, asthma, allergies and chronic infections.[94] Dr. Nicole Bruinsma of the Canadian Public Health Association raised this problem before the Committee, but pointed out that the impact of pesticides on this population group are still poorly understood, just as they are in the case of other vulnerable groups:

> There are also multiple-chemical-sensitive people with less than perfect health, including those with asthma or allergies, as well as individuals with a chemical sensitivity, who suffer the effects of pesticide exposure more severely than those without. We have to wonder how those people became so sensitive to begin with. Is it because of the multiple exposures they've received throughout their foetal and adult life? For such people day-to-day life can present

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[91] A.P. Hoyer, P. Grandjean, T. Jorgensen, J.W. Brock, H.B. Hartvig, "Organochlorine Exposure and the Risk of Breast Cancer," *Lancet*, 352(9143), 1998, p. 1816-1820.

[92] Sierra Club of Canada, Brief to the Committee.

[93] R.H. Allen, "Breast Cancer and Pesticides in Hawaii: The Need for Further Study," *Environmental Health Perspectives*, Vol.105, 1997, p. 679-683.

[94] Nova Scotia Environmental Health Centre, Web site, January 2000; The Environmental Hypersensitivity Association of Canada, Web site, January 2000.

challenges, since there is not often anywhere to hide from the widespread and persistent use of these toxins.[95]

People in Contact with Pesticides

Workers

7.4 In its evidence to the Committee, the Canadian Labour Congress (CLC), which represents 2.3 million workers in the public and private sectors, did not hesitate to assert that workers are the primary victims of chronic illnesses caused by pesticides. The CLC pointed out that most of the findings used by the International Agency for Research on Cancer (IARC) come from studies of occupational exposure.[96] It added that people who handle pest control products as part of their work (farmers and their families, forestry workers, exterminators, grounds keepers, municipal and railway employees, employees in pesticide manufacturing plants, etc.) are sometimes exposed to very high doses of pesticides. In addition to suspected long-term effects, these workers are likely to suffer from chronic effects of pesticides if they do not follow handling precautions. The Canadian Public Health Association told the Committee that pesticides can persist on the skin for many months after exposure and some studies indicate that the children of adults exposed can be effected by the residues.[97] The Association told the Committee that non-Hodgkin's lymphoma seems to be observed principally among people who are most exposed to pesticides, namely those who work with them. Some researchers have succeeded in demonstrating a significant dose-response relationship between fields sprayed with herbicides and the risk of contracting non-Hodgkin's lymphoma,[98] while others have not succeeded in statistically demonstrating this link between the presence of pesticides and the various illnesses observed.[99] Dr. Nicole Bruinsma who belongs to the former group states,

> Patients with non-Hodgkin's lymphoma, they have a very peculiar gene mutation on one of their chromosomes. It's when one of the genes actually lifts out of the DNA and turns itself around, which is called an inversion mutation. It's very rare. We find it in non-Hodgkin's lymphoma. Where else do we find it? We find it in those people who have had the greatest exposure to pesticides. We find it in workers who handle concentrated technical formulations, in farmers and other agriculture workers, in exterminators, in pesticide applicators, in lawn and golf-course owners, and in Vietnam War veterans who have been exposed to large doses of 2,4-D or Agent Orange in the Vietnam War.[100]

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[95] *Evidence*, Meeting No. 4, November 16, 1999.

[96] Canadian Labour Congress, Brief to the Committee, *Evidence*, Meeting No. 7, November 23, 1999.

[97] Canadian Public Health Association, Brief to the Committee.

[98] D.T. Wigle, R.M. Semenciw, K. Wilkins, D. Riedel, L. Ritter, H.I. Morrison, Y. Mao, "Mortality Study of Canadian Male Farm Operators: Non-Hodgkin's Lymphoma Mortality and Agricultural Practices in Saskatchewan," *Journal of the National Cancer Institute*, Vol. 82, No. 7, April 4, 1990; H.I. Morrison, K. Wilkins, R. Semenciw, Y. Mao, D. Wigle, "Herbicides and Cancer," *Journal of the National Cancer Institute*, Vol. 84, No. 24, December 16, 1992.

[99] A. Blair et al., "Occupational and Environmental Risk Factors for Chronic Lympholic Leukaemia and Non-Hodgkin's Lymphoma," *1997 UHPHS Workshop Proceedings: Determining the Role of Environmental Exposures as Risk Factors for B-Cell Chronic Lymphoproliferative Disorders*; G. deJong, G.M. Swaen, J.J. Slangen, "Mortality of Workers Exposed to Dieldrin and Aldrin: A Retrospective Cohort Study," *Occupational and Environmental Medicine*, Vol. 54, 1997, p. 702-707; P.C. Oloffs et al., "DDT, Dieldrin and Heptachloroperoxide in Humans with Liver Cirrhosis," *Clinical Biochemistry*, Vol. 7, 1974, p. 297-306.

[100] *Evidence*, Meeting No. 4, November 16, 1999.

Two problems were discussed by witnesses that, in the Committee's opinion, make workers even more vulnerable to pesticide exposure. First of all, the information provided to farmers by pesticide suppliers via the product label, which consists of warning them about the risks linked to handling their products, may be inadequate. Secondly, according to Mr. Yussuff of the Canadian Labour Congress, the precautions (protective equipment, waiting time after an application) suggested to those who handle pesticides may be less effective than commonly thought, and may not protect users from the chronic effects of pesticide exposure:

> Limited controls are possible for acute worker exposures, such as personal protective equipment and re-entry times for workers to re-enter sprayed fields, but these are inefficient and far less efficacious in practice than they are in theory. They also fail to protect workers from the chronic health effects of pesticides, which are, in industrialised countries such as Canada, much more important than acute effects.[101]

Residents of the North

7.5 The Canadian North is loosely defined as the territory above the 60th parallel (the Arctic and subArctic), from the Beaufort Sea in the west to Davis Strait in the east, from Ellesmere Island in the north to Hudson's Bay in the south.[102] This area makes up 40% of Canada's land mass and has a population of 80,000 including more than 40,000 native people. Like people who work with pesticides, northern populations are in greater contact with these contaminants than are other Canadians. One reason for this, as discussed earlier in the chapter on pesticides and the environment, is that certain substances, specifically those that are persistent, end up in the North through atmospheric transportation, even though their use is virtually unknown in the Arctic (figure 4.2). Organochlorines, one cateogory of persistent organic pollutants (POPs), are still found in significant amounts in our environment. Most are now banned in Canada because of their characteristics, but some countries still use them. Native people in the North have a traditional diet of game and fish, which are often contaminated with chemicals, thus their total exposure to contaminants is higher.[103] The Committee learned from David Stone, Director of the Northern Science and Contaminants Research at Indian and Northern Affairs Canada that, because of their higher consumption of wild animal flesh, people living in the North have considerably higher concentrations of POPs in their blood than do people in southern Canada. The Inuit are particularly affected by the accumulation of toxaphene, chlordane and polychlorinated biphenyls (PCBs) in their bodies. Fetuses and nursing infants are primarily susceptible to POPs absorbed through the placenta and breast milk respectively. According to current findings, concentrations of organochlorines in Inuit breast milk in women from Nunavit are from two to ten times higher than those measured in a non-aboriginal population in the South.[104]

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[101] *Evidence*, Meeting No. 7, November 23, 1999.

[102] J. Jensen, K. Adare and R. Shearer, *Canadian Arctic Contaminants Assessment Report*, Northern Contaminants Program, Indian and Northern Affairs Canada, 508 p., 1997.

[103] There are other native populations elsewhere in Canada that also have a traditional diet, such as groups in Saskatchewan that collect berries, mushrooms and wild rice, and where aerial spraying may well deposit pesticides on the vegetation. These groups are also very likely to be vulnerable to pesticide exposure, but the Committee did not receive any evidence on this point.

[104] *Evidence*, Meeting No. 16, December 14, 1999.

7.6 While these results are known to people in the North, and are of concern, representatives of the Inuit Circumpolar Conference and Indian and Northern Affairs Canada explained to the Committee that the traditional diet plays a vital role in the life of the Inuit because of the economic, social and health aspect which make consumption of traditional foods essential and inevitable. It has been estimated, for example, that it would cost close to $35 million a year to replace traditional foods with commercial products. Researchers also consider the traditional diet healthier and more nutritious than food brought in from the South. According to the results of Phase I of the Northern Contaminants Program, directed by Indian and Northern Affairs Canada, a drop in the consumption of traditional foods would result in a wide range of negative consequences for the populations concerned, such as less physical activity, obesity, dental cavities, anaemia, reduced resistance to infection and diabetes. Hunting and fishing are also important socio-cultural activities.The Inuit are encouraged, and do continue, to include traditional foods in their daily diet.[105] Experts consider that the risks associated with not consuming traditional foods are greater than the risks associated with long-term exposure to the contaminants present in those foods. The Committee has concluded that it is vitally important to allocate sufficient resources to the problem of northern contaminants for the population to be better protected.

Research on Protecting Vulnerable Groups

7.7 The problem of contaminants in traditional foods led to the formulation of a research program on POPs, the Northern Contaminants Program (NCP), the first phase of which (NCP-I) was completed in 1997. The annual budget of $5.4 million for Phase II comes from Treasury Board and the following four departments, which are also participating to different degrees in management of the Northern Contaminants Program: Indian and Northern Affairs Canada, Health Canada, Fisheries and Oceans Canada, and Environment Canada. For example, Health Canada's Health Protection Branch (HPB) advises on the risks posed by certain POPs and devotes about $1 million a year to research into the potential problems associated with them.[106]

7.8 The thrust of the NCP is to evaluate the risks of contamination associated with traditional foods consumed by Aboriginal peoples. Phase I of the Program mapped the distribution in space and over time of contaminants in the North and confirmed the hypothesis that the contaminants come from the South. These findings made an important contribution to our knowledge about contamination of traditional foods. NCP-I made it possible to prove, among other findings, that toxaphene is the main organochlorine contaminant found in all fish analysed in the Canadian Arctic, even though this pesticide has not been in use in Canada since 1982. This demonstrates the importance of considering all pesticides when studying their effects, even those that have been discontinued.

7.9 The findings of NCP-I were also used in a similar circumpolar study published in 1997-98 by the Arctic Monitoring and Assessment Program (AMAP). NCP-II, which will continue until 2003, aims to identify the main species that are exposing northern populations to the most contaminants, as well as the regions and populations at highest risk.[107] Given the importance of traditional foods in the life of northern residents, the continuation of this Program is essential.

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[105] *Evidence*, Meeting No. 16, December 14, 1999; Inuit Circumpolar Conference and Inuit Tapirisat of Canada, Brief to the Committee.

[106] *Evidence*, Meeting No. 2, November 2, 1999; *Evidence*, Meeting No. 16, December 14, 1999.

[107] *Evidence*, Meeting No. 16, December 14, 1999.

7.10 The Committee was disturbed by suggestions from some witnesses that the Program, like a number of other government-sponsored scientific projects, has been hard hit by budget cuts. The Committee understands that the NCP is grappling with a lack of financial resources. Dr. Joe Losos of the Health Protection Branch at Health Canada stated:

> The Department of Indian Affairs and Northern Development has a program on toxins in the north. We support them with our health assessments. We have long-term studies on some of these toxins to see if the effect is long-term. So it really depends on the toxin. We are putting about $1 million worth into this program. It was one of the victims of program review cuts, if you will, so we don't do as much as we would like to do in that area.[108]

7.11 With respect to research on workers who come in contact with pesticides, the Health Protection Branch (HPB) at Health Canada is monitoring the potential effects of pesticides on farming communities in Canada, via the Laboratory Centre for Disease Control. The HPB is also participating in a research program on diet and a national inquiry into breast milk, which are providing data on Canadians' exposure to a whole range of potentially harmful substances, including pesticides.[109] The Department of Health also informed the Committee that it promotes projects in certain priority areas, such as endocrine disruptors, under the Toxic Substance Research Initiative. The Department's representative told the Committee about plans to reorganize the HPB, which entail development of an action plan for a new environmental health strategy, designed to increase the ability of the Department and the Branch to reduce the dangers that environmental risks pose to health.

7.12 Despite all these studies, which appear to be both numerous and relevant, the Committee heard criticisms of the type of research done on worker exposure. According to Merryl Hammond, founder of Citizens for Alternatives to Pesticides, studies done on worker exposure are not satisfactory because the research protocols (number of samples, sampling time, differences between the pesticide analysed and pesticide actually registered) are poorly formulated:

> The very limited tests done on agricultural workers for occupational exposure are totally inadequate ... Generally the larger the sample the better. Okay, that's great. I would look for thousands, frankly ... A chemical was accepted for use in Canada; thirteen farmers were occupationally exposed to it.
>
> For how long? It's a new chemical. We don't know what it's going to do to anybody. For how long should we expose this large sample? Ideally a full season or two of use to see what might happen.
>
> For four to seven hours they were exposed — one working day. Half of them were in enclosed tractors; some were in open-cab tractors. That's four to seven hours and thirteen farmers.
>
> But it gets worse ... The chemical that was being registered was called Imazethapyr, but the surrogate chemical we accepted was totally different. They said it was chemically similar, but it was metabolized differently in the human body. The company told us that.

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[108] *Evidence*, Meeting No. 2, November 2, 1999.
[109] *Evidence*, Meeting No. 2, November 2, 1999.

> So in this country in March 1994, we registered Imazethapyr, nicknamed Pursuit, but the tests had been done on a pesticide called Assert. Those tests I've just told you about — on thirteen farmers for four to seven hours — were on a totally different chemical. But because of the system we have, that was deemed adequate. That was the occupational safety test for Imazethapyr. The decision document is dated March 30, 1994.[110]

7.13 Health Canada is currently implementing a strategy on environmental health. The Department is looking at science capacity, interaction between internal and external experts, and international linkages that will enable it to obtain the latest scientific information. It is also considering possible changes to its risk-management framework, with a more specific focus on especially vulnerable populations. A representative of the Department noted the existence of a Study Centre funded by Health Canada, and the completion of projects on the cumulative effects of toxic products sponsored by the departments of Environment and Health.[111] Health Canada also makes information available to the public on multiple chemical sensitivity, but this syndrome is not legally recognized in Canada as a true medical condition.

7.14 After this series of hearings, the Committee is in a position to say that while the scientific evidence remains incomplete, pesticides do represent a sufficiently disturbing threat to human beings and the environment to justify special attention. For one thing, the vulnerability of children and the other groups listed is increasingly recognized and for another, the scientific data are insufficient and additional research is necessary. It also seems probable that workers may be less well protected and informed than we had believed, in terms of the information made available to them for their protection. The members of the Committee consider that the government must protect Canadians by implementing pro-active pesticide management. Good management must begin with a recognition of the danger that pesticides pose to the population, and by adequate funding for the research that will make it possible to define that danger more accurately.

The Committee recommends that Health Canada take the necessary steps to bring about legal recognition of multiple chemical sensitivity syndrome.

The Committee recommends that the government fund Health Canada and its government partners so that they can assess the relevance of existing research protocols involving vulnerable population groups, draft new protocols where necessary and pursue current research on the impact of pesticides on human health, particularly on vulnerable groups.

7.15 The existing legislation does not seem to provide special protection for vulnerable population groups.[112] This was the assertion of the World Wildlife Fund and the Canadian Institute of Child Health to the Committee. In the United States, the *Food Quality Protection Act* is an example of legislation that has been specifically amended to protect children (see the next Chapter).[113]

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[110] *Evidence*, Meeting No. 10, November 30, 1999.
[111] *Evidence*, Meeting No. 126, June 1, 1999.
[112] *Evidence*, Meeting No. 5, November 17, 1999.
[113] S. Schwartz and G.W. Chance, "Children First," *Alternatives Journal*, 25:3, Summer 1999.

Ms. Sandra Schwartz, Director, Environmental Programs, Canadian Institute for Child Health, added:

> The Food Quality Protection Act, the 1996 US pesticide reform law, was motivated in part by this particular book, entitled Pesticides in the Diets of Infants and Children, a 1993 National Academy of Sciences study. It found that the regulatory process in the US did not account for children's special vulnerabilities. It recommended that the process be changed to better safeguard the health of infants and children. The law was adopted unanimously, based on the overwhelming evidence presented in that report.
>
> In order to protect Canadian children from pesticide exposure, we need similar child-centred protection strategies within our own government structures.[114]

7.16 The Committee was struck by these observations, and has concluded that the Canadian government should take recent child protection developments in the United States as its model, extending the protection to all vulnerable groups.

The Committee recommends that the new Pest Control Act give priority to protection of the environment and human health, and especially to the protection of all vulnerable population groups.

The Committee recommends that the government ensure legal protection, through the new Pest Control Act, for the most vulnerable groups: fetuses, children, seniors, women, Aboriginal people, persons suffering from multiple chemical sensitivity or in poor health, and professional users of pesticides. To this end, decisions on pesticides should be based on the protection of the most vulnerable groups.

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[114] *Evidence*, Meeting No. 4, November 16, 1999.

PART C:

THE REGULATORY SYSTEM

8. RISK AND VALUE ASSESSMENTS

8.1 One of the primary missions of the Pest Management Regulatory Agency (PMRA) is to protect human health and the environment by minimizing the risks associated with the use of pesticides. The fundamental way in which it does this is through the implementation of the *Pest Control Products Act* (PCPA) and its Regulations which state that all products imported, manufactured, sold or used in Canada to control pests must be registered. In order to be registered a pesticide must meet two criteria. The health and environmental risks must be found to be acceptable and the product must be deemed to have value. This Chapter examines the manner in which the PMRA, through its registration process, determines both the risks and value associated with the use of pesticides. The subsequent Chapter discusses the manner in which PMRA uses regulations to manage risk. Information on generic risk assessment and risk management practices is outlined in Appendix 8.1 and 8.2.

Risk Assessment

8.2 The risk presented by the use of a pesticide to human and environmental health is a function of two things, the toxicity of the pesticide and the quantity of the pesticide to which humans and the environment are exposed. Accordingly, the PMRA requires both adequate toxicity data and adequate

exposure data in order to conduct good risk assessments.[115] The registrant (person wishing to register a pesticide) is required, by the PMRA, to perform a number of tests on the toxicity of the pesticide and its fate in the environment. The PMRA analyzes the results to determine whether the pesticide should be registered and how it should be used. Increasingly, the general practices involved in conducting risk assessments are harmonized internationally and the PMRA follows these practices.

8.3 It is important to note that it is the registrants and not the PMRA who conduct the laboratory and field studies upon which the regulatory decisions are based. Some witnesses and Committee members are concerned by this fact, seeing the possibility for biases to enter studies conducted and submitted by the registrants. In order to ensure the quality and integrity of the data submitted, the PMRA requires that the studies be conducted according to what is known as good laboratory practice (GLP) and has published a Regulatory Directive with this title. The principles of GLP are intended to promote the quality and validity of test data. GLP covers the organizational process and the conditions under which laboratory and field studies are planned, conducted, monitored, recorded and reported. The Organization for Economic Co-operation and Development (OECD) has harmonized GLP activities and has established a monitoring scheme via Good Laboratory Practice Monitoring Authorities (GLPMA). A GLPMA audits participating laboratories and issues compliance statements to those that meet the GLP criteria.

8.4 All studies for the PMRA that are initiated after April 1, 2000 must be GLP compliant and will, therefore, require a certificate to this effect. The PMRA may grant waivers to laboratories that do not have GLP certification (via the GLPMA) depending on their certification under similar programs, and the relative significance and potential impact of the studies in question.

8.5 The Committee discussed the possibility of recommending that the PMRA conduct its own risk assessments rather than having them done by the registrant. A recommendation to this effect is not being made at this time because of the existence of the PMRA's GLP program, the feasibility of conducting these types of studies for all products and the fact that other federal departments also accept data submitted from the registrants in support of product registration. We do however think that it is important that the PMRA be more specific about the conditions under which it grants waivers.

The Committee recommends that the data quality and integrity systems that would be accepted as equivalent to the Organization for Economic Co-operation and Development's good laboratory practices program be clearly defined as a Pest Management Regulatory Agency Regulatory Directive.

Human Health

Toxicity

8.6 It is clearly impossible to perform toxicity experiments on humans. Tests conducted in support of registration are therefore performed on mammals with relatively short life spans such as rats, mice and dogs, and the results are extrapolated to humans.

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[115] R. Bertell, Correspondence to the Committee, February 27, 2000; Learning Disabilities Association of Canada (LDAC), Correspondence to the Committee, March 2, 2000; Canadian Institute of Child Health (CICH), Correspondence to the Committee, March 3, 2000.

8.7 There are a number of potential health effects that pesticides may cause, ranging from no effect to death. The toxicity tests required of the applicants are designed to observe a range of specific effects (often described as endpoints). These tests include:

- acute toxicity;
- short-term toxicity;
- long-term toxicity and carcinogenicity;
- reproductive and developmental toxicity;
- genotoxicity;
- metabolism and toxicokinetics;
- neurotoxicity; and
- immunotoxicity and endocrine disrupting potential (based on the tests listed above).[116]

8.8 Neurotoxicity tests are normally required only for classes of chemicals known to interfere with the nervous system. Endpoints such as the effects on the immune system and the effects on the hormonal system through endocrine disruption do not currently have specific tests but are examined through the results of other studies. The PMRA publishes regulatory directives, available to registrants and the public, that list the tests required for different product types. According to the PMRA, these lists of tests are becoming increasingly harmonized internationally, especially with the United States.[117] In addition, the actual methods for conducting the tests are standard methods published by the OECD[118] and/or the United States Environmental Protection Agency.

8.9 The lists of what tests are required for registration must be flexible so that they can be modified to accommodate new potential risks that become evident as knowledge about pesticides increases. Amendments to the Pest Control Products Regulations have been proposed to ensure that the general registration requirements are described as comprehensively as possible.[119]

8.10 The Committee is satisfied with this type of amendment, yet is still concerned that the PMRA regulatory directives that specify what is required of applicants, are not up to date with the current status of scientific knowledge regarding the damage pesticides can cause to human health. It is already evident that some substances have the potential for causing severe effects on the nervous and endocrine systems, yet specific mandatory testing for these effects is not a requirement for all registrations. The Committee received a number of briefs concerning this shortcoming. The Sierra Club of Canada, the Canadian Environmental Law Association (CELA), the Ontario College of Family Physicians (OCFP) and the Learning Disabilities Association of Canada (LDAC) propose that developmental neurotoxicity testing and tests for endocrine disruption should be standard

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[116] Pest Management Regulatory Agency, Web site, December 1999.

[117] *Evidence*, Meeting No. 2, November 2, 1999.

[118] Organization for Economic Co-operation and Development (OECD), Guidelines for the Testing of Chemicals, October 1998.

[119] Pest Management Regulatory Agency (PMRA), *Proposed Amendments to the Pest Control Products Act*, January 1999.

requirements for all product types. The Committee found the following statement by Ms. Barbara McElgunn of The Learning Disabilities to be interesting in this regard.

> I was interested in reading the testimony from the transcript of previous people who have appeared before this committee, particularly Dr. Claire Franklin's testimony in which she said that all pesticides undergo an extensive pre-market assessment before they are allowed to be sold in Canada. This statement is often heard from PMRA and it may be comforting and soothing to the public but it is not in our view entirely accurate. For example, there are important gaps in the toxicity database for most pesticides, the lack of developmental neurotoxicity test data being one of them. It is of concern to us that developmental neurotoxicity testing is not mentioned in recent PMRA notices concerning impending re-evaluation of organic phosphate pesticides that act via neurotoxic action, nor in the draft document pertaining to harmonization of rules with the EPA to protect children's health. Though in the U.S. this testing gap is a major issue being addressed.[120]

8.11 Virtually all witnesses called for fully transparent risk assessment and risk management processes and several recommended that the process that the PMRA follows should be clearly defined and published.[121] In addition, the LDAC, the CELA and the OCFP proposed that the processes be written into legislation or regulation. The Committee is of the opinion that the risk assessment and risk management processes followed by the PMRA should be made public.

The Committee recommends that all risk assessment and risk management processes which the Pest Management Regulatory Agency uses be clearly defined and published.

8.12 While the Committee recognizes that the practice the PMRA follows for collecting and utilising human toxicity data is standard, we find that there is much truth in the evidence given by Dr. Bertell's and the LDAC's presentations.[122] If tests are not required for a certain pesticide then the possible endpoints studied in those tests can never be part of the risk equation. In order for the PMRA to act in a precautionary manner, the lists of mandatory toxicology studies for the different categories of pesticides must be more inclusive. Dr. Bertell also thinks that risk assessment methodology is limited in scope because it relies on tests that produce a dose response. Other witnesses suggested that the exposure durations specified in the international protocols should be expanded so that fetal and juvenile development can be more adequately assessed.[123]

The Committee recommends that the Pest Management Regulatory Agency add tests for neurotoxicity and, when available, for endocrine disruption, to the lists of toxicology studies that are mandatory for all pesticides.

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[120] *Evidence*, Meeting No. 4, November 16, 1999.

[121] Canadian Association of Physicians for the Environment, Brief to the Committee, 1999; the Canadian Environmental Law Association and the Ontario College of Family Physicians, Brief to the Committee, 1999; and by the Crop Protection Institute of Canada, Brief to the Committee, 1999.

[122] *Evidence*, Meeting No. 16, December 14, 1999; *Evidence*, Meeting No. 4, November 16, 1999.

[123] Correspondence from Learning Disabilities Association of Canada to the Committee, March 2, 2000; Correspondence from the Canadian Institute of Child Health to the Committee, March 3, 2000.

The Committee recommends that the Pest Management Regulatory Agency work with the Organization for Economic Co-operation and Development and the United States Environmental Protection Agency to amend protocols to investigate pesticide effects on fetal development and children, including neurological development.

Exposure

8.13 Evaluating the levels to which humans are exposed to a specific pesticide is a complicated task. Exposure may occur, for example, through handling of pesticides by workers, ingesting residues on food or in contaminated water or through the skin after contact with the pesticide. Human exposure is estimated for workers, those who are inadvertently exposed (bystanders), including children, and for the intake of pesticides from trace amounts that remain on food (food residues).

8.14 The worker and bystander exposure (both dietary and non-dietary) to a pesticide is estimated by the PMRA using information on how the pesticide is used, how much is used, and how often. Results of field trials that are conducted for the registrant by third parties show the level of pesticide residue that could appear on food (given the directions for use).

8.15 While relatively detailed information is available from the PMRA with respect to the general requirements for toxicity studies there is little published information on how the PMRA evaluates exposure. A case in point is the exposure assessments that are conducted for children. Many witnesses stated that estimations were conducted for 70-kilogram workers and simply scaled back for children.[124] While this may have been the case in the past, in correspondence to the Committee, the PMRA stated that this is not the case now.[125]

8.16 The PMRA indicated that there is an extensive international database of exposure studies that the PMRA uses to characterize various subpopulations that may be exposed, including children. For children's non-dietary exposure assessment, exposure from all routes and pathways are considered (e.g. dermal through direct or indirect contact with pesticides, non-dietary ingestion through transfer of residues from hand to mouth and inhalation). The special considerations that were discussed in the Chapter on the special vulnerability of children, such as unique activity patterns and physiological characteristics are factored into these assessments. In the absence of specific data, conservative default values are used to obtain the highest estimation of exposure. Internationally accepted standard approaches for deriving estimates of non-dietary exposure for infants and children have been developed and PMRA scientists are participating in and monitoring this activity closely.[126] In correspondence to the Committee, Dr. Bertell pointed out that while the PMRA states that they take into account the differential exposure to children, there is no information on how they take into account the fact that children have "developing immune and neurological systems which may not react in the same way as adults."[127]

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[124] Canadian Association of Physicians for the Environment, Brief to the Committee, 1999; the Canadian Environmental Law Association and the Ontario College of Family Physicians, Brief to the Committee, 1999; and the Crop Protection Institute of Canada, Brief to the Committee, 1999.

[125] Correspondence from Dr. C. Franklin to the Committee, February 29, 2000; August 24, 1999 and December 20, 1999.

[126] Correspondence from Dr. C. Franklin to the Committee, February 29, 2000.

[127] Correspondence from Dr. Bertell to the Committee, February 27, 2000.

Human Health Risk Assessment

8.17 In order to evaluate health risks to humans the estimated exposure levels are compared to the recommended safe levels as established through toxicology tests.

8.18 The first step in determining safe levels for human exposure is to establish, for each toxicology test, the highest level of pesticide for which no adverse effect or endpoint can be observed in the test animal. This is called the no observed adverse effect level (NOAEL). Of the NOAELs from each test, a reference NOAEL is chosen, often the NOAEL that represents the lowest concentration not to have produced an adverse effect.

8.19 Test animals, etc., however, are not humans. The problem then arises as to how to estimate safe levels in humans from the safe levels estimated for test animals in laboratory studies. This extrapolation is done by the PMRA for two different types of exposure, those to workers or bystanders, and for assessing the risks of food ingestion.

Workers and Bystanders

8.20 In this type of assessment the level considered safe for the test animals (reference NOAEL) is divided by the estimated exposure to the workers or bystanders to determine the margin of safety (MOS).

Typically, the PMRA considers a MOS of 100 to be acceptable to account for potential variability in response and extrapolations from animals and humans[128] (i.e. the estimated exposure should be 100 times smaller than the reference NOAEL).

8.21 Dr. Bertell and the Campaign for Pesticide Reduction criticized this approach because they believe that in order to assess the possible impacts adequately, the results from actual worker, bystander and community exposure studies are required, in addition to the laboratory studies.[129] (Mandatory adverse effects monitoring and reporting will be discussed in the next chapter.)

Food Safety

8.22 In order to establish safe dietary consumption levels for humans when extrapolating from test animals, the PMRA divides the reference NOAEL by a safety factor. Specifically, it divides by a safety factor of ten.

8.23 There is another source of variability that stems from the fact that there are normal differences within the human population. In other words, different people may respond differently to the same exposure. Thus the NOAEL is divided by another safety factor of ten. The PMRA therefore calculates the safe level for humans, called the allowable daily intake (ADI), by dividing the NOAEL by a safety factor of one hundred (factor of 10 times factor of 10).

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[128] Pest Management Regulatory Agency, Web site, December 1999.

[129] *Evidence*, Meeting No. 16, December 14, 1999; *Evidence*, Meeting No. 3, November 4, 1999.

8.24 The concept of safety factors and their applications to the determination of ADIs for pesticides and food additives was established by the World Health Organisation (WHO) in the early 1960s.[130] With respect to safety factors, however, the World Wildlife Fund, as well as the Canadian Environmental Law Association and the Ontario College of Family Physicians suggested that the PMRA should follow the example of the United States in terms of developments in child protection.[131] In the United States, the *Food Quality Protection Act* (FQPA) requires the Environmental Protection Agency (EPA) to use an additional safety factor of 10 when assessing the risk posed by the presence of a pesticide in the diet of children. This factor can be eliminated only when reliable data is available to demonstrate that the residue will be safe for children. In the US, this additional safety factor is designed to take into account potential pre- and post-natal toxicity and completeness of the data with respect to exposure and toxicity to children.[132] Given the vulnerability of children, fetuses and other sectors of the population discussed in Chapters 6 and 7 (Vulnerability of Children and Other Vulnerable Populations), the Committee feels that an increased level of protection from the potential harm of pesticides is required. We think, therefore, that the PMRA should go beyond the US requirements and take the vulnerability of certain sectors of the population into account when doing any kind of risk assessment, not just children and not just for dietary intake.

The Committee recommends that:

(a) Health Canada continue research into the adequacy of an additional factor of 10 at protecting children's health;

(b) at least one additional safety factor of 10 be used in determining the tolerance of pesticide residues in food stuffs in order to protect the health of vulnerable sectors of the population including children and fetuses;

(c) acceptable margins of safety used when conducting non-dietary assessments should be increased by at least one factor of 10 from 100 to 1000; and

(d) the use of this additional safety factor should be given a legislative basis in the new Pest Control Act.

8.25 The increase in safety factor will be used as a buffer against current uncertainty surrounding the exposure and sensitivity of children and other susceptible populations to pesticides.

8.26 There are instances where small amounts of pesticides, or residues, remain on a food commodity. To ensure that human ingestion of a pesticide from residues does not exceed the safe level as described by the allowable daily intake, the PMRA establishes maximum limits for the levels of pesticide residues that are allowed on food. These limits are called maximum residue limits or MRLs. The Committee learned that the method for establishing MRLs is similar in all developed countries and international organizations. Based on field trials, estimates are made as to how much pesticide is likely to remain on food and how much of the food will likely be consumed. The MRLs for a pesticide

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[130] Amdur, M.O., Doull, J., and Klaassen, C.D, *Casarett and Doull's Toxicology: the Basic Science of Poisons*, Fourth Edition, Pergamon Press, 1991.

[131] *Evidence*, Meeting No. 5, November 17, 1999; *Evidence*, Meeting No. 11, December 1999.

[132] *United Stated Code*, Title 21, Chapter 9, section 346a.

are accepted only if the total of the MRLs for all the possible different commodities adds up to less than the acceptable daily intake for that pesticide. The PMRA currently establishes MRLs on a pesticide by pesticide basis and does not take into account the consumption of multiple pesticide residues. MRLs are listed in the tables of the *Food and Drugs Act* regulations and infractions are monitored by the Canadian Food Inspection Agency (CFIA), an arms length agency under Agriculture and Agri-Food Canada. The CFIA is responsible for all inspection services related to food safety, economics, fraud, trade-related requirements and animal and plant health programs.

8.27 Between 1994 and 1998 there were a total of 44,379 food samples tested by the CFIA. Of these, 805 samples were found to contain residues that exceeded allowable limits and were therefore in violation of the *Food and Drugs Act*. Violations in domestic products have been increasing while violations on imported products have been staying constant or possibly decreasing.[133] If a food product has a residue of a pesticide that does not have a MRL under the *Food and Drugs Act* regulations then the residue of that pesticide must be below a default value of 0.1 ppm. (See Appendix 8.3)

8.28 In their testimony, several health protection groups, including the Sierra Club of Canada and the Canadian Institute of Child Health, expressed concern about pesticide residues in food. The public and the media share this concern. An article published in May 1999 noted a study showing that the number of residual pesticides detected in fruit and vegetables had doubled since 1994.[134] The CFIA suggested that the increase in pesticide residues detected is due to improved scientific methods which make it possible for experts to detect very small quantities of residues. The CFIA stressed the fact that the concentrations detected in the study noted in the article, did not exceed the prescribed limits and thus did not pose any danger to health. The CFIA explained that it is Health Canada's responsibility to determine whether this kind of observation must lead to changes in the MRLs.[135]

8.29 The Committee remains concerned about food safety despite the fact that the MRLs are not often exceeded. The concern lies in two major areas. Firstly, in determining MRLs, possible sources of pesticide exposure other than through the diet are ignored. These other sources may contribute to the aggregate risks of pesticides exceeding the established safe level for humans. Secondly, many pesticides act in a similar fashion. MRLs, however, continue to be established on a pesticide by pesticide basis, ignoring the cumulative effects of residues from similar pesticides that could also be present on food and in the environment. Assessing pesticides on an individual basis also ignores possible interactions between different pesticides. The Committee was informed that the PMRA plans eventually to include cumulative and aggregate risk in their risk assessments, particularly since the law in the United States now requires these features to be taken into account.[136] The Committee, however, shares the concerns expressed by many witnesses including the Canadian Institute of Child Health, the World Wildlife Fund, the Canadian Environmental Law Association and Ontario College of Family Physicians and the Inuit Circumpolar Conference that pesticides are currently assessed individually despite the fact that they are being encountered in the environment in mixtures.[137] This

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[133] Canadian Food Inspection Agency, "Levels and Incidences of Pesticide Residues in Selected Agricultural Food Commodities Available in Canada During 1994-1998," Technical Report, November 1998.

[134] "Level of Pesticide Residues up in Canadian Produce," *Globe and Mail*, May 24, 1999.

[135] *Evidence*, Meeting No. 128, June 8, 1999.

[136] *Evidence*, Meeting No. 126, June 1, 1999.

[137] *Evidence*, Meeting No. 4, November 16, 1999; *Evidence*, Meeting No. 5, November 17, 1999; *Evidence*, Meeting No. 16, December 14, 1999; Canadian Environmental Law Association and Ontario College of Family Physicians, Brief to the Committee.

can result in a severe underestimation of the risks to which we are being subjected and must be changed immediately.

The Committee recommends that the Pest Management Regulatory Agency incorporate cumulative and aggregate risks and the possible interaction between pesticides into their evaluation and, more specifically, in the determination of maximum residue limits and that cumulative and aggregate risks be defined in the new Pest Control Act.

8.30 Investigations conducted by the CFIA should consider the MRLs of each individual pesticide on foodstuffs, and the total amount of all pesticide found.

Environmental Health

Toxicity

8.31 The PMRA conducts risk assessments of environmental health using virtually the same method it uses to examine risks to human health. Safe levels are estimated by laboratory experiments and then compared to estimates of the concentrations that one might expect to find in the environment given the proposed use of the pesticide. The applicant is responsible for completing the studies required by the PMRA, many of which are now harmonized with those of the international community.

8.32 To determine toxicity, a range of species including birds, invertebrates, plants and fish species are subjected to long and short term exposure, and to a variety of concentrations of the pesticide.[138] For each test and species the highest concentration at which no effect is observed is recorded. This is the no observed effect concentration (NOEC). The lowest NOEC, recorded for the most sensitive species, is deemed to be a safe environmental concentration.

Environmental Exposure

8.33 The environmental concentration of the pesticide is estimated using a number of analytical results. The pesticide's chemical properties are determined (e.g. physical state, vapour pressure, how easily it can dissolve in water and/or fat). How long the pesticide will stay in the environment before it degrades is determined by studies on its degradation by light, water, air and biological processes. The PMRA also determines whether or not the pesticide may accumulate in organisms higher up the food chain.[139] These studies are used to estimate how the pesticide moves in the environment and to estimate the expected environmental concentration. The registrants or government departments may perform field studies to obtain actual environmental measures of a pesticide's behaviour.

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[138] Pest Management Regulatory Agency, Web site, December 1999.

[139] Ibid.

Environmental Risk Assessment

8.34 Environmental risk assessment compares the estimated safe concentration for the environment (reference NOEC) with the expected environmental concentration (in much the same way as for worker/bystander assessments). A high ratio between the NOEC for the environment and the expected environmental concentration indicates a large margin of safety (MOS), with limited impact of the pesticide expected. As the ratio decreases the risk that the pesticide will cause harmful effects on non-target organisms increases.

8.35 The Committee has learned that, in some instances, the current environmental assessment fails to prevent environmental damage. As an example, there have been numerous fish kills reported in Prince Edward Island as a result of pesticide runoff following applications made according to the label directions.[140] Officials with the Department of Technology and Environment for that province believe that the review process for environmental risk needs to be improved to include greater emphasis on potential environmental impacts and to increase the quality and quantity of data reviewed.[141] The Committee feels that increased co-operation with other federal and provincial departments will help with this goal.

8.36 Dr. Bernard Hill, an Agriculture and Agri-Food Canada Environmental Chemist at the Lethbridge Research Centre, gave an example of an instance where he submitted data about a pesticide and never received an adequate response as to why the product was eventually registered. The Committee is surprised that the PMRA seems to be ignoring evidence from experts indicating that there are negative environmental effects resulting from the use of certain pesticides. The testimony from some experts indicates that particular pesticides should be banned from certain uses or de-registered altogether, yet the PMRA is on record as having said that it finds the risk to be minimal.[142]

The Committee recommends that the Pest Management Regulatory Agency's environmental safety evaluations include more comprehensive and in-depth studies on the impacts of pesticide use on the environment (e.g. water, air, soil, sediment, and non-target organisms).

The Committee recommends the re-establishment of a direct mechanism for submission of independent scientific findings to the PMRA. This type of submission would be followed by mandatory feedback from the Agency to the individual or group who submitted the information.

Please refer to Chapter 15 for more information on interdepartmental co-operation.

Value Assessment

8.37 In order for a pesticide to be registered, the registrants must not only demonstrate that the pesticide does not pose an unacceptable risk to human or environmental health, they must also demonstrate that the pesticide has value. The value, or usefulness, of pesticides can be a controversial

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[140] *Evidence*, Meeting No. 14, December 8, 1999.

[141] Ibid.

[142] *Evidence*, Meeting No. 12, December 2, 1999.

topic. For those who believe that pesticides can make positive contributions, the value of a pesticide lies in its contribution to managing pest problems. Pesticide use can have economic, health and environmental benefits both directly and indirectly.

8.38 Economic benefit can be measured as decreased loss of crop yield due to weed invasion or in the decreased loss of wood due to mould in lumberyards. Health benefits can result from situations such as killing cockroaches, using fungicides in carpets to prevent fungal growth during the life of the carpet, or using chlorine to disinfect water in swimming pools. Examples of environmental benefits of pesticide use include the use of chlorine to clean water in wastewater treatment facilities[143], the use of fumigants to inhibit the entry of foreign insects that could devastate Canadian forests and the use of insecticides to prevent the destruction of urban forests.

8.39 There are witnesses who believe that the risks far outweigh the benefits for most, if not all, uses of pesticides.[144] Certainly, all community-based groups that appeared before the Committee believe that the potential risks of using pesticides for cosmetic purposes far outweigh any benefits. The Committee agrees that the risks arising from cosmetic uses of pesticides far outweigh the benefits and that these uses should be deemed to have no value. Furthermore, the Committee agrees that pesticides that have no value should not be registered. Please refer to the final recommendation in Chapter 12.

8.40 On the other hand, some witnesses agree that pesticides can have positive effects, but are aware that these benefits must be viewed in light of the costs. This not only includes monetary cost but also those associated with negative effects on human health, on other organisms, or on the environment. These costs are difficult to assess since there are few standard ways of measuring them. The PMRA's value assessments have three main components: efficacy, economics, and sustainability.[145] Only efficacy and sustainability will be dealt with in this report.

Sustainability Evaluation

8.41 Sustainability evaluation is a relatively new addition to the consideration of value by the PMRA.[146] It is an assessment of the role of the proposed treatment in pest management and the overall production systems for the commodity to be treated, including:

- compatibility with and contribution to sustainable production practices and integrated pest management, including consideration of pest biology and the population level at which an organism becomes a pest;

- comparison with alternative products and practices, including potential contribution to risk reduction (for example, by virtue of lower persistence, toxicity or bioaccumulation, or reduced impact on beneficial and other non-target organisms); and

- contribution to resistance management.[147]

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[143] Canadian Water and Waste Water Association, Brief to the Committee.
[144] *Evidence*, Meeting No. 13, December 7, 1999; *Evidence*, Meeting No. 15, December 13, 1999.
[145] Pest Management Regulatory Agency, Web site, December 1999.
[146] Ibid.
[147] Ibid.

Integrated pest management and sustainability will be discussed further in Chapter 11 on Alternatives to Pesticides.

Efficacy Evaluation

8.42 Registrants must perform efficacy studies, normally in the form of field trials to assess product performance and host tolerance. These trials also enable them to establish appropriate label claims and to determine the lowest application rate and frequency required to provide effective and reliable pest control, without damaging the host or crop. The PMRA assesses the results of these studies to determine if the product works as the registrant claims and to recommend the lowest possible application rate that continues to control the pest while minimizing health and environmental risks.[148]

8.43 Agricultural and industrial stakeholders, through the Economic Management Advisory Committee,[149] are recommending that this requirement be greatly reduced or eliminated in an effort to reduce timelines.[150] The Committee feels that this would be a mistake. Efficacy analysis is a valuable aid in minimizing the application of pesticides and associated risks to the environment and human health.

The Committee recommends that the Pest Management Regulatory Agency continue to require a full set of efficacy data for the registration of pesticides.

Additional Risk Assessment Practices

Assessments of Formulants and Contaminants

8.44 Most of the toxicity data for a pesticide product is for the ingredients that make the pesticide work (active ingredients). Formulants are the ingredients in the end use product, other than the active ingredients and often make up the bulk of the products. They are considered trade secrets and do not have to be disclosed on the label. Often called "inert ingredients," many formulants are not inert at all. While some may be true inert ingredients, they may also be solvents, surfactants (soaps) or oils that may have toxic properties.[151] Formulants are only starting to become an important part of the safety assessment of pesticides.[152] The Canadian Environmental Law Association and the Ontario College of Family Physicians proposed that the PMRA complete the development of its policy on formulants. This policy would outline how the PMRA will go about completing assessments of formulants in registered pesticides. These formulants should be assessed such that their use would not be allowed until their potential effects are understood.[153] A PMRA policy on formulants has been drafted and is expected to be published for comment in 2000.[154]

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[148] Ibid.

[149] This Committee was formed in 1995 to advise the PMRA.

[150] Pest Management Regulatory Agency, Web site, EMAC Workplan, Goal 2.1.3, March 10, 1999.

[151] World Wildlife Fund, *The Problem with Pesticides in Canada: A Briefing Book for Parliamentarians*, April 1999; Sierra Club of Canada, Brief to the Committee.

[152] Pest Management Regulatory Agency, Web site, December 1999.

[153] Canadian Environmental Law Association and the Ontario College of Family Physicians, Brief to the Committee.

[154] *Evidence*, Meeting No. 23, February 17, 2000.

8.45 Contaminants are present in products but, unlike formulants, are not intentionally added. Contaminants are normally found at very low concentrations and are thus often called microcontaminants. Many contaminants do not pose any safety risk (e.g. water) but, as with formulants, some can be of significant concern.

8.46 Given the potentially toxic nature of formulants and contaminants (including microcontaminants) in a pesticide, the Committee is concerned that their possible environmental and health risks are not being adequately assessed. (Please refer to Chapter 13 on Informing and Involving the Canadian Public for information on the labelling of 'toxic' ingredients.)

The Committee recommends that formulants be subject to the same assessment, review and access to information provisions as the "active ingredient," including the requirement that they be listed on the pesticide label. Contaminants, including microcontaminants, should be reviewed thoroughly and all toxicity information should be available to the public. These new aspects of the safety assessments should be incorporated into the new Pest Control Act.

New Pesticide Applications

8.47 Normally, major new uses of pesticides require an assessment by the PMRA. Currently, if a pesticide is registered for use on corn and is subsequently going to be used on a genetically modified corn, the PMRA does not re-assess the pesticide. The Canadian Food Inspection Agency (CFIA) informed the Committee that they do not consider changes in pesticide use patterns during the course of their assessment of genetically engineered plants. The PMRA only provides advice on resistance management to CFIA during the registration process for genetically modified plants. The Committee is concerned that this type of change in use pattern can be effected without a re-evaluation of that pesticide by the PMRA.

The Committee recommends, given the lack of long-term data on pesticide use on genetically modified plants, that the new Pest Control Act specify that the use of a pesticide on a genetically modified plant require an amendment to the pesticide's registration. The amendment process should necessitate an assessment of the use of that pesticide on the genetically modified plant.

Burden of Proof

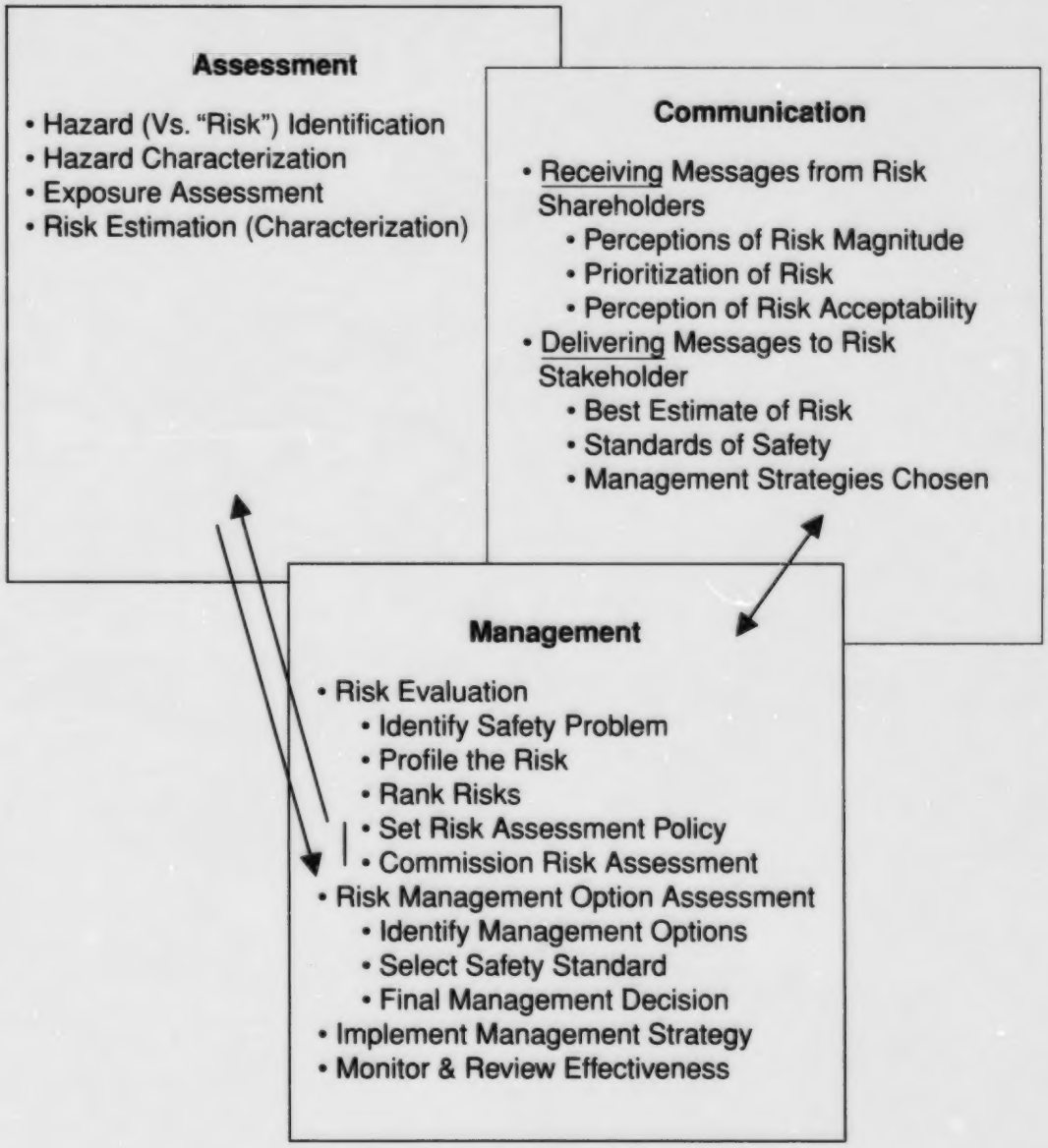
8.48 Pesticide manufacturers are ultimately responsible for the safety of their products according to the PMRA's testimony of June 1, 1999.[155] For pesticides that have yet to be registered the burden of proof lies with the manufacturer of the pesticide to demonstrate that the pesticide is safe for its intended use. Within the current regulatory system this burden shifts slightly to the government and the general public for pesticides once they are already registered and on the market. According to The Canadian Environmental Defence Fund, once a pesticide is on the market, the burden of proof that any unacceptable risk does occur rests with those who seek the removal of the product from the market.[156] While the Committee recognises that the government must accept a certain amount of

[155] *Evidence*, Meeting No. 126, June 1, 1999.
[156] *Evidence*, Meeting No. 5, November 17, 1999.

responsibility when registering products, we believe that the current system puts too much of the onus on the public and government and not enough on the manufacturer.

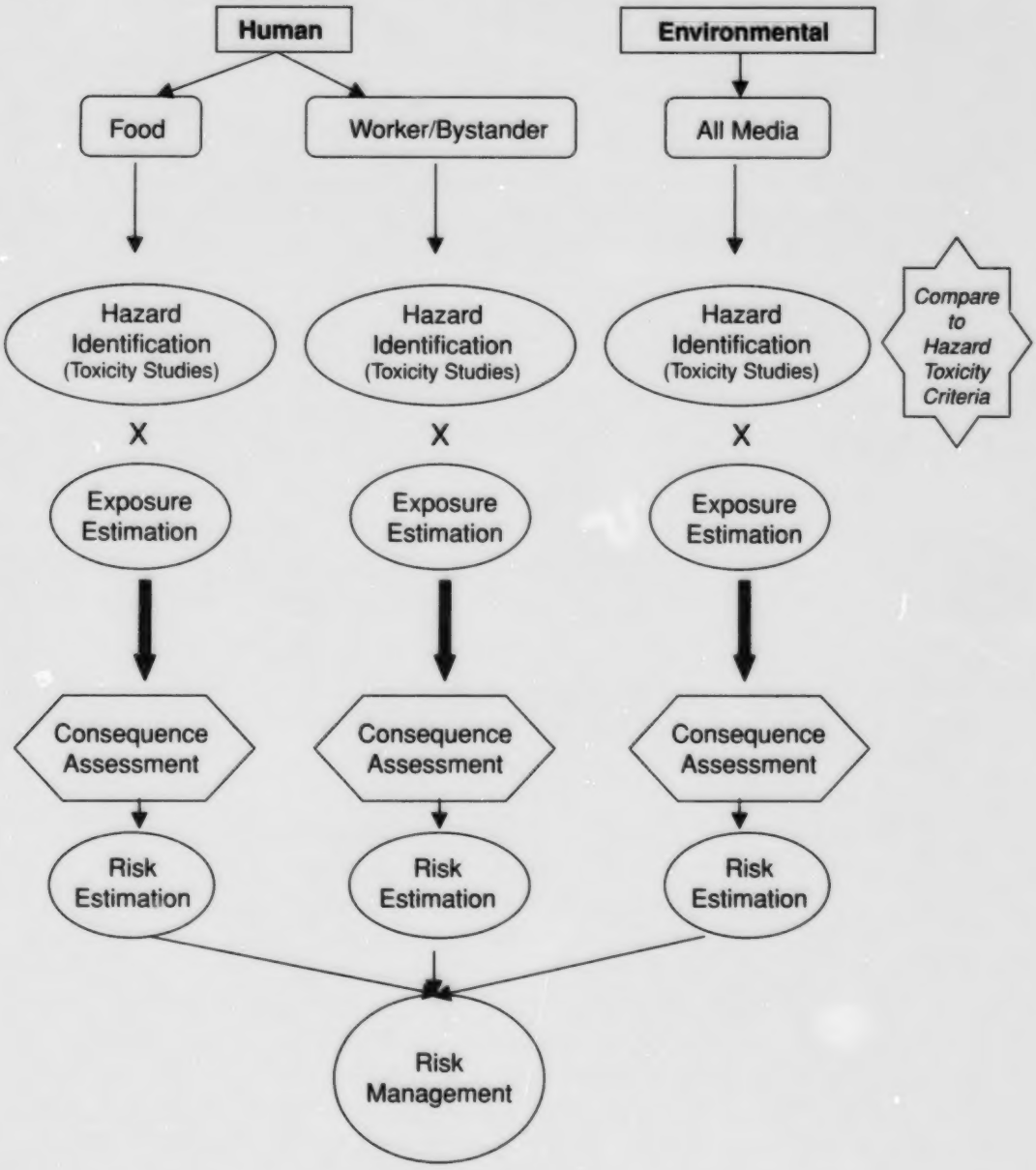
The Committee recommends that the burden of proof that a pesticide does not pose an unacceptable risk remain with the manufacturer both before and after registration.

APPENDIX 8.1
INTEGRATED RISK ANALYSIS*



* Conrad Brunk, Risk Management Workshop, 1998.

APPENDIX 8.2
Risk Assessment



Risk Assessment Methods

Risk Assessment:

The basic steps of risk assessments are Hazard Identification, Exposure Assessment, Consequence Assessment and Risk Estimation.

1. Hazard Identification: An assessment is begun with an attempt to identify the hazards associated with the pesticide. This is where the actual properties of the substance in question are examined as well asits propensity for causing toxic effects. This is also called the inherent toxicity of the substance. The hazard posed by a substance can be measured or quantified by determining the amount that kills 50% of the test organisms (LD_{50}), the amount that causes an effect in 50% of terrestrial organisms (EC_{50}), the amount that causes an effect in 50% of aquatic organisms, etc. Governments have guidelines that classify these numbers based on relative toxicity so that a comparison between substances is possible when evaluating the potential hazards to different organisms (e.g. rat, fish, bird) in different media (i.e. air, water, soil and sediment). These classification guides are very useful in step three and are consequently becoming increasingly harmonized internationally as a result of international protocols and the work of organizations such as the Organization for Economic and Co-operation and Development (OECD).

2. Exposure Assessment: This step determines if the substance enters the environment or comes in contact with humans or animals. It is here that questions are asked, such as when, where and how does exposure take place? In what quantities/concentrations? Is the substance persistent and will it bioaccumulate thus tending to continue to increase in concentration in the environment?

3. Consequence Assessment: The first and second steps are fitted together to form the basis of risk. Hazard times Exposure is equal to Risk. If either Hazard or Exposure is missing, or equal to zero, then there is no risk (3 X 0 = 0).

Hazard X Exposure = Risk

   With this equation it becomes clear that there can be a substance with lower inherent toxicity (and therefore Hazard) but high Exposure that results in high risks (2 X 6 = 12) or a substance with higher inherent toxicity and lower Exposure that also results in high risk (4 X 3 = 12).

   Consequence Assessment involves identifying the outcome of the risk. It is where guidelines are used and an attempt is made to determine what would be the actual effect on the person/organism/environment/etc. Is the impact major (e.g. death, loss of reproductive capacity), minor (e.g. slight decrease in toenail size), or moderate. It is also in this step that what and/or who is the most at risk is identified.

4. Risk Estimation: This last step involves determining the acceptable level of exposure to the target populations or, in other words, how much can humans, fish, frogs, children, etc. be exposed to the substance with no short or long term adverse effects. The No Observable Adverse Effect Level (NOAEL) is most often used to calculate the estimated acceptable exposure. In conducting a risk assessment the NOAEL is divided by a safety factor.

Once an acceptable dose is established (NOAEL / safety factor) it is compared to what has been estimated from the exposure assessment. If the predicted exposure is higher than the calculated acceptable dose then controls must be put in place to mitigate release and/or exposure. This enters into risk management.

APPENDIX 8.3

A Summary of Canadian Food Inspection Agency's Report on Levels and Incidences of Pesticide Residues in Selected Agricultural Food Commodities Available in Canada During 1994-1998

INTRODUCTION

This document summarizes the information contained in the Canadian Food Inspection Agency's report on the Levels and Incidences of Pesticide Residues in Selected Agricultural Food Commodities Available in Canada During 1994-1998, dated 6 November 1998. Results for the fiscal year 1998-1999 have not yet been published.

For reporting purpose, food commodities are divided into four categories, domestic fresh fruits and vegetables, domestic processed fruits and vegetables, imported fresh fruits and vegetables, and imported processed fruits and vegetables. There are four basic figures that are reported in this document:

(1) the total number of samples taken;

(2) the number of samples that were without detectable residues (Green Light);

(3) the number of samples that had positive results for residues (Yellow Light); and

(4) the number of those positives that were in violation of the maximum residue limits set by Health Canada (Red Light).

There were a total of 44,379 samples taken during this reporting period. Their breakdown between the four categories of food commodities is as follows:

Table 1: Total Number of Sample Taken

Total number of samples	Fresh	Processed
Domestic	6,879	378
Imported	34,591	2,531

Green Light

Of the total 44,379 samples taken there were 35,487* samples that were without detectable residues (W.D.R.). Their breakdown between the four categories of food commodities is as follows:

Table 2: Total Number of Samples without Detectable Residues (W.D.R.)

*Total number W.D.R.**	Fresh	Processed
Domestic	5,511 (80%)	349 (92%
Imported	27,255 (78.8%)	2,372 (93.7%)

Yellow Light

Of the total 44,379 samples taken there were 10,682* samples that were found to contain residues (positives). Their breakdown between the four categories of food commodities is as follows:

Table 3: Total Number of Samples that Tested Positive for Residues

*Total number of positives**	Fresh	Processed
Domestic	1,710 (24.8%)	33 (8.7%)
Imported	8,767 (25.3%)	172 (6.8%)

Red Light

Of the total 44,379 samples taken there were 805* samples that were found to contain residues that exceeded allowable limits and were therefore in violation of *the Food and Drugs Act*. Their breakdown between the four categories of food commodities is as follows:

Table 4: Total Number of Samples in Violation

*Total number in violation**	Fresh	Processed
Domestic	82 (1.2%)	2 (0.53%)
Imported	711 (2%)	10 (0.4%)

*** You may note that the figures do not always add up as expected (i.e. total without detectable residues plus the number of positives do not exactly equal the total number of samples taken). This is due to the use of the multi-residue testing system. The numbers when grouped this way can be misleading if not presented carefully. As an example, if there were 100 apples sampled and 5 were positive for pesticide A and a different 5 were positive for pesticide B then 90 apples would be without detectable residues. If on the other hand the same 5 apples were positive for both pesticides A and B then there would be 95 apples without detectable residues. If presented only in this light it would appear the risk was lower in the second situation, which is not the case. The numbers in the report have been calculated and presented so that this type of false impression is not given. Thus numbers and percentages sometimes exceed the total. Table 6 in CFIA's report indicates the finding of multiple pesticide residues in single sample. For example, samples that contained residues of 5 pesticides were identified on 9 occasions.**

Generally speaking violations in domestic products have been increasing (0.4% prior to 1991, 0.55% from 1992-1994 and 1.2% for 1994-1998) and violations on imported products has been staying constant or possibly decreasing (2.6% prior to 1991, 2.74% from 1992-1994 and 1.94% for 1994-1998).

The four appendices in CFIA's report show the findings for the different commodities sampled and the residues found by pesticide. These appendices are for each of the four categories. There are different standards for the different pesticides and there are different concentrations for different food commodities. This is so that a food that makes up a larger portion of the diet has stricter standards. Specific concentrations can be found in the Regulations under the *Food and Drugs Act*.

Specific residue finding continue to show that the occurrence of environmentally harmful organochlorines such as DDT and metabolites, aldrin, dieldrin, endrin, heptachlor, lindane and a few others are rarely found in domestic samples. In imported shipments these compounds, especially DDE (the major metabolites from DDT breakdown) continue to be found in greater frequencies. Even in imported shipments though, these pesticides rarely exceed prescribed levels.

Tessa MacIntosh

9. RISK MANAGEMENT

9.1 In managing risks associated with pesticides there are two options: to reduce the toxicity of available products or to reduce the quantity of pesticides to which humans and the environment are exposed. The PMRA has a number of tools at its disposal to achieve these goals. The main focus of this report on pesticides and the PMRA has been on risk assessment and risk management practices associated with registration activities. The PMRA can, however, also develop strategies such as integrated pest management and can also encourage organic farming. These pesticide reduction techniques are discussed at length in the Chapter entitled Alternatives to Pesticides.

9.2 After the risk assessment portion of the registration process, possible risks to the environment and/or to human health can be managed by the refusal to register a product or by the application of restrictions pertaining to use. It is important that risk managers be fully aware of any uncertainties that are present in the risk assessment and of any precautionary steps, such as the application of safety factors that are used. The availability of this type of information makes risk management decisions, such as when to apply the precautionary principle, easier to make.

9.3 This Chapter discusses the management of pesticide risks (via regulations), the precautionary principle and unacceptable risk. In January 2000 the Privy Council Office released a report entitled *Risk Management in Public Policy: Report of the Assistant Deputy Minister Working Group on Risk Management*. This report points out that effective risk management relies more on the existence of a

flexible process than on rigid rules. The report states that, "while there will always be pressure for a rules-based system for managing risk, the very nature of risk and uncertainty makes such a system inappropriate in many circumstances." The Committee understands this concept and, as such, we have attempted to provide guiding principles for risk management rather than strict rules and definitions.

The *Pest Control Product Act* and Regulations

9.4 The primary method by which the PMRA manages the risks associated with pesticides is the implementation of the Pest Control Product Regulations. Section 6 of the *Pest Control Product Act* states that regulations can be made regarding the registration of controlled products and the procedures to be followed should registration be refused, suspended or cancelled. Regulations may also be made regarding the requirements to demonstrate the efficacy and safety of pesticides, their manufacture, storage and use, as well as requirements regarding the information on the label (sections 6 (1)(i), (j), and (k) of the *Act*). Label information must identify any significant hazard to public health, plants, animals or the environment and instructions respecting the procedures to mitigate these hazards (section 27(k)(ii) of the Regulations). Currently, section 18(d)(ii) of the Regulations require the Minister to refuse to register a pesticide if its use would lead to an unacceptable risk of harm to public health, plants, animals or the environment. Section 45 of the Regulations states that no person shall use a product in a manner inconsistent with the directions and restrictions shown on the label.

9.5 Furthermore, section 20 of the Regulations authorizes the Minister to cancel or suspend a registration when, based on current available information, the safety or value of the product is no longer acceptable.

Refusal to Register

Unacceptable Risk and the Precautionary Principle

9.6 The refusal to register a product under section 18(d)(ii) of the Regulations relies on the concept of "unacceptable risk." This term is not defined in the Act or the Regulations. Interpretation of unacceptable risk is, however, of paramount importance in risk management. The Commission of the European Communities recently published a report on the precautionary principle.[157] This discussion document describes the determination of what constitutes an acceptable level of risk as a political responsibility. The Committee is in agreement and, based on information received throughout this study, has concluded that children's health should be the focus, and indicator of, what constitutes 'unacceptable risk' for the regulation of pesticides. This focus on children must start with the methods used to assess risk and continue to post-registration monitoring and risk communication (please refer to Appendix 8.1).[158]

The Committee recommends that children's health be the focus and indicator of what constitutes 'unacceptable risk' for the regulation of pesticides.

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[157] Commission of the European Communities, *Communication from the Commission on the Precautionary Principle*, February 2, 2000.

[158] Conrad Brunk, Risk Management Workshop, 1998.

9.7 The Committee feels that, because pesticides are toxic by design and because there are gaps in the data on pesticides and their effects on children, especially long term, the precautionary principle should be applied. In effect, where there is a lack of full scientific certainty, preventative action should be taken, including further research and refusal to register a product. Incorporating this principle into the operational portion of the legislation and having the regulations guide its implementation will make its application mandatory for all risk management decisions where lack of certainty exists.

9.8 The application of the precautionary principle to the interpretation of unacceptable risk would help to minimize the risks to human and environmental health. Chapter 2 entitled 'The Need for New Legislation' recommends a definition for the 'precautionary principle.'

Implementation of the Precautionary Principle

9.9 The issue of how and when to use the precautionary principle has given rise to considerable debate both nationally and internationally. In a policy framework it is necessary to find the correct balance between differing views so that proportionate, non-discriminating, consistent and transparent actions can be taken in the name of this principle.

9.10 Within the risk analysis framework (see Appendix 8.1), the precautionary principle is part of risk management. The precautionary principle should not be confused with the element of caution that scientists apply when conducting risk assessments.[159] In the risk management decision tree in Appendix 9.1 the areas where the precautionary principle is likely to be invoked are indicated. Different areas and disciplines will apply the precautionary principle in slightly different ways depending on the desired level of protection. In the case of pesticides, a high level of protection is desired because they are toxic by design. Essentially, given the *a priori* hypothesis that pesticides are toxic, the PMRA should apply the precautionary principle whenever the answers to risk management questions are unclear.

9.11 In more general terms, the Commission of the European Communities has identified measures for the application of the precautionary principle. Measures should be:

- proportional to the chosen level of protection;
- non-discriminatory in their application;
- consistent with similar measures already taken;
- based on an examination of the potential benefits and costs of action or lack of action;
- subject to review in light of new findings; and
- capable of assigning responsibility for producing the scientific evidence necessary for a more comprehensive risk assessment.

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[159] Commission of European Communities, *Communication from the Commission on the Precautionary Principle*, February 2, 2000.

9.12 As the discussions surrounding the implementation of the precautionary principle are ongoing, we believe that it is important for the PMRA to continue to take part in both national and international discussions to ensure that consistent policies are developed.

9.13 The Committee heard from some witnesses who feel that risk management decisions should be based solely on the hazard (or inherent toxicity) of a substance without taking expected exposure into account. Dr. Rosalie Bertell believes that the use of the precautionary principle based on hazard assessment alone is warranted because the potential harm to children is so great.[160] Indeed, the Canadian government has planned for the virtual elimination of the most dangerous substances although the process for identifying these substances under the federal Toxic Substances Management Policy takes into account potential exposure as well as inherent toxicity. To eliminate all chemicals that pose any sort of hazard is impractical. This being said, there are policies that can be put in place that can influence how precautionary the risk management will be.

9.14 In risk management, there are two types of situations where errors can occur. One is when a decision is made not to register a pesticide when, in fact, future evidence demonstrates that the risk would have been acceptable. The second is when a decision is made to register a pesticide when, in fact, future evidence (such as monitoring data) demonstrates that the risk was unacceptable. Obviously, there are consequences that may result from both of these scenarios.

9.15 A precautionary approach dictates that when the evidence suggests that there is probably a risk associated with a pesticide, it must not be registered, thus possibly making the first type of error. There are those, including Dr. Rosalie Bertell and Ms. Melissa McDonald, who would permit only this type of error and none of the second kind thus effectively banning all pesticides.[161] Others are willing to accept the possibility of making the error of having some pesticides registered, though they should not have been if the decisions are based on sound science.[162] As the Commissioner of the Environment and Sustainable Development pointed out to the Committee on December 13, 1999, the precautionary principle should not be used as an excuse not to do sound science. Risk managers acknowledge that risk can rarely be reduced to zero.[163] Thus, the registration of pesticides that should not have been registered does occur. The goal remains however, to keep this type of error to a minimum by demanding that scientific studies be the most current and rigorous available.

Refusal to Register and the Toxic Substances Management Policy

9.16 In June 1995, the federal government released the Toxic Substances Management Policy (TSMP), a policy that provides a framework for managing toxic substances that are released into the environment. The key management objectives of this policy are:

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[160] Rosalie Bertell, Correspondence to the Committee, February 27, 2000.

[161] *Evidence*, Meeting No. 16, December 14, 1999; *Evidence*, Meeting No. 3, November 4, 1999. Campaign for Pesticide Reduction, Brief to the Committee.

[162] Canadian Environmental Law Association and Ontario College of Family Physicians, Brief to the Committee; Canadian Association of Physicians for the Environment, Brief to the Committee; Learning Disabilities Association of Canada, Brief to the Committee.

[163] Commission of European Communities, *Communication from the Commission on the Precautionary Principle*, February 2, 2000.

- virtual elimination from the environment of toxic substances that result predominantly from human activity and that are persistent and bioaccumulative (referred to in the policy as Track 1 substances); and

- management of other toxic substances and substances of concern, throughout their entire life cycles, to prevent or minimize their release into the environment (referred to in the policy as Track 2 substances).

9.17 In 1998, the PMRA published a regulatory proposal entitled 'The Pest Management Regulatory Agency's Strategy for Implementing the Toxic Substances Management Policy'. Some Committee members are concerned that this document does not apply the conditions of the TSMP strictly enough. During the meeting of November 2, 1999, one Committee member questioned the difference between elimination to *below the limits of quantification*, as per the TSMP, versus to *very low*, as per the PMRA implementation document, and asked the PMRA if they thought that this made their document inconsistent with the TSMP.

9.18 Noting that the interdepartmental TSMP Forum reviewed the implementation document and that it did not find any inconsistencies, the PMRA told the Committee that it finds its implementation document to be consistent with the TSMP.[164] Nonetheless, the Committee feels that the PMRA's implementation document could be improved by using the exact terms found in the Policy.

The Committee recommends that the Pest Management Regulatory Agency ensure that its implementation document is consistent with the federal Toxic Substances Management Policy by, among other things, using the exact terms found in this policy.

9.19 The Committee is also very concerned that pesticides containing dioxin (a Track 1 substance) as a microcontaminant are still being registered by the PMRA.[165] The World Wildlife Fund,[166] the Canadian Environmental Law Association and the Ontario College of Family Physicians and the Inuit Circumpolar Conference[167] propose an immediate ban of all pesticides that contain Track 1 substances and a PMRA implementation document that reflects this commitment. (Please refer to Table 4.1 for a list of pesticide active ingredients that are classified as Track 1.)

The Committee recommends that pesticides containing any Track 1 substance under the federal Toxic Substances Management Policy not be registered or re-registered.

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[164] *Evidence*, Meeting No. 2, November 2, 1999.

[165] Ibid.

[166] World Wildlife Fund, *The Problem with Pesticides in Canada:* A Briefing Book for Parliamentarians, April 1999.

[167] Canadian Environmental Law Association and the Ontario College of Family Physicians, Brief to the Committee; Inuit Circumpolar Conference and the Inuit Tapirisat of Canada, Brief to the Committee.

9.20 The TSMP establishes criteria for substances that immediately trigger a process to eliminate them from the environment by preventing their measurable release. Many witnesses recommended the adoption of toxicity criteria that would trigger a decision not to register a pesticide.[168] These would include criteria for endocrine disruption, neurotoxicity and carcinogenicity. If a substance meets certain criteria then it is automatically deemed to pose an unacceptable risk without investigation of potential exposure.

The Committee recommends that the Pest Management Regulatory Agency establish science-based inherent toxicity criteria, such as thresholds for endocrine disruption, neurotoxicity, and carcinogenicity so that pesticides meeting any of these thresholds not be registered or, if already on the market, be de-registered.

Restrictions on the Use of Pesticides

9.21 The PMRA may decide that a pesticide can be registered but it may manage the human and environmental risks by imposing restrictions on its use. Restrictions that can be applied to reduce risks include:

- restrictions on where the product can be used (e.g. greenhouses only);
- conditions of use (e.g. specifying protective equipment that should be worn, spray equipment that should be used, weather conditions for application, etc.);
- protecting specific parts of the environment (e.g. specifying buffer zones between pesticide application and rivers and lakes or other sensitive areas); and
- limiting how much pesticide can be used and on what crops it can be applied (e.g. if the risk assessment suggests that the residues will be above the Maximum Residue Limits then the pesticide may not be allowed for use on food or feed crops).

9.22 Information regarding restrictions is usually printed on the label and under section 45 of the Pest Control Product Regulations it is an offence not to follow the instructions. The Canadian Environmental Law Association and the Ontario College of Family Physicians and the Government of Prince Edward Island indicated that since the PMRA's risk management relies so heavily on the label, compliance with label instructions is very important.[169] They indicated that the PMRA should improve its inspection and enforcement operations and that it must not hesitate to apply the full range of enforcement penalties that are available to it in order to ensure compliance. Indeed, the PMRA indicated that it is ready to implement the process of Administrative Monetary Penalties (AMPs) and the proposed new legislation is supposed to include enhanced enforcement capabilities through clearly defined offences, increased powers for inspectors and higher maximum penalties. This type of inspection and enforcement, while critical, is targeted at the manufacturer/registrants. The use of

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[168] *Evidence*, Meeting No. 4, November 16, 1999. *Evidence*, Meeting No. 5, November 17, 1999. *Evidence*, Meeting No. 16, December 14, 1999. Canadian Environmental Law Association and the Ontario College of Family Physicians, Brief to the Committee; Action Chelsea for the Respect of the Environment, Brief to the Committee.

[169] Canadian Environmental Law Association and the Ontario College of Family Physicians, Brief to the Committee; *Evidence*, Meeting No. 14, December 8, 1999.

pesticides should be investigated to determine whether end-users comply with label instructions.[170] This will enable the PMRA (and indeed the government in general) to determine whether they can continue to rely on product labels as a key risk management tool.

The Committee recommends that the Pest Management Regulatory Agency improve its inspection and enforcement operations and, in the case of non-compliance, apply the full range of available enforcement penalties.

The Committee recommends that the Pest Management Regulatory Agency work with the provinces and territories to investigate the use of pesticides to determine whether users comply with label instructions.

Cancellation or Suspension of Registration

9.23 The Committee recognizes that serious harm can result from the use of pesticides despite the restrictions placed on pesticide use and despite compliance with label instructions. For example, witnesses from the Department of Technology and Environment from Prince Edward Island told the Committee about fish kills that resulted from pesticides applications made according to the label instructions. Sometimes, even when the best science is applied to the risk assessment process, the true risks cannot be fully determined and unanticipated impacts may come to light post-registration. The Minister of Health has the power to suspend or cancel a registration if it is found, after registration, that the pesticide does pose an unacceptable risk. The witnesses from P.E.I. pointed out that the PMRA risk managers thus require an effective feedback mechanism to inform them of when label restrictions are not adequate.[171] The ability to manage pesticide risks after registration therefore depends greatly on post-registration monitoring. Feedback in the form of monitoring and evaluation is a key component in risk management.

9.24 The Committee is concerned about the current state of post-registration monitoring. In his 1999 report, the Commissioner of the Environment and Sustainable Development stated that none of the stakeholders (registrant, PMRA, other government agencies) are specifically required to monitor for environmental contamination or impacts of chemicals on non-target species. In addition, there are no requirements for reporting any adverse effects that come to light, for example, as a result of post-registration fieldwork, laboratory studies or hospital admissions.

9.25 The World Wildlife Fund witness noted in her testimony of June 10, 1999, that reviews of environmental effects are very difficult to undertake without monitoring data.[172] The Federation of Canadian Municipalities indicated that the PMRA should use the strong federal mandate with respect to toxic substances to establish a thorough system for the monitoring of pesticides.[173] Dr. Pierre Mineau (Environment Canada, National Wildlife Research Centre) stressed that the manufacturer should bear the responsibility of providing monitoring data since Environment Canada is not in the position to monitor every product's environmental effects.[174] The Committee is in agreement with the Commissioner on Environment and Sustainable Development, the World Wildlife Fund and the

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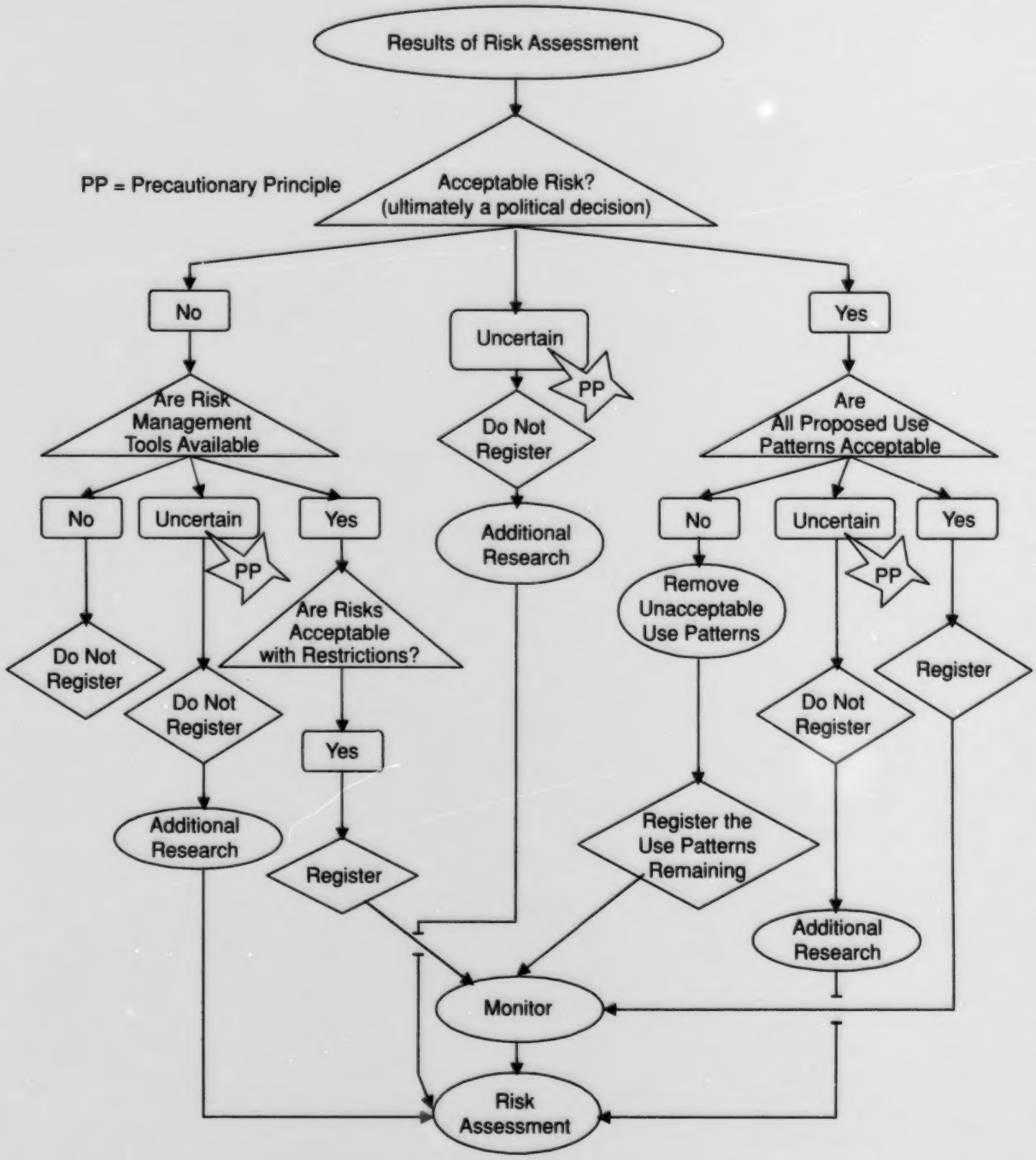
[170] Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, 1999.
[171] *Evidence*, Meeting No. 14, December 8, 1999.
[172] *Evidence*, Meeting No. 129, June 10, 1999.
[173] *Evidence*, Meeting No. 10, November 30, 1999.
[174] *Evidence*, Meeting No. 12, December 2, 1999.

Federation of Canadian Municipalities that post-registration monitoring of pesticides is lacking and needs to be improved in terms of extent and co-ordination. Specifically, monitoring and research need to be conducted with a view to determining effects on children. In addition, monitoring will be required to ascertain the PMRA's progress towards the policy of risk reduction that will be discussed in the Chapter on Alternatives to Pesticides.

The Committee recommends that, as a condition of registration for all pesticides, the new Pest Control Act require registrants to conduct routine post-registration monitoring, to report all adverse effects to the Pest Management Regulatory Agency, and to co-ordinate with government departments and industry associations to avoid unnecessary overlap and duplication.

The Committee recommends that the Pest Management Regulatory Agency establish a database of all reported adverse effects of pesticides and that the information from this database be used in future risk assessments.

Appendix 9.1
Risk Management Decision Tree



10. RE-EVALUATION OF PESTICIDES AND SPECIAL REVIEWS

Re-evaluation

10.1 Pesticides, once registered, and therefore deemed to be safe and of value, do not presently undergo systematic re-evaluation unless there is evidence or strong indication that they pose unacceptable risks to human health or the environment.

10.2 In his 1999 report, the Commissioner of the Environment and Sustainable Development criticized the PMRA for not re-evaluating "old pesticides,"[175] pointing out that of the 500 active ingredients in registered pesticides, over 300 were approved before 1981 and over 150 before 1960. The Commissioner expressed frustration over the lack of progress that the Canadian government has made towards the re-evaluation of pesticides.

[175] Old pesticides are loosely described as pesticides that were registered prior to 1995.

> The need to re-evaluate pesticides has been formally recognized by the federal government for over 13 years, and we expected that it would have developed a program to do so. We found Canada's track record to be one of inaction and unfulfilled commitments.[176]

As new information becomes available on the fate and effects of toxic chemicals, new testing schemes are introduced into the risk assessment framework. The re-evaluation of old pesticides is necessary because pesticides that were registered 15 years ago did not receive the same scrutiny as those that are currently being registered.

10.3 Although the PMRA is conducting re-evaluations of some old pesticides, progress has been slow and it is unclear if these reviews have incorporated parameters such as cumulative and aggregate risk. The Committee discovered that some re-evaluations have been under way for up to 20 years (e.g. review on pentachlorophenol).[177] In the view of the Commissioner of the Environment and Sustainable Development, the World Wildlife Fund (WWF), the Canadian Environmental Defence Fund (CEDF) and the Canadian Manufacturers of Chemical Specialities Association (CMCS), the re-evaluation of pesticides is not as effective, or progressing as quickly, as it should be in Canada. They propose, therefore, that a rigorous, clear, timely and well-funded re-evaluation program be established immediately.

10.4 The CMCS indicated that its members currently have difficulty understanding the way evaluations will be addressed, including the amount of information that will be accepted from other countries, the cost to the registrants, and the timelines. The CMCS, the CEDF, the WWF and the Crop Protection Institute (CPI) feel that the re-evaluation program should set precise triggers for what will be evaluated, when and why, and establish a mechanism for communication and for public appeals.[178] The PMRA responded, in part, to these concerns by publishing a regulatory proposal entitled 'A New Approach to Re-evaluation' in December of 1999.

10.5 This new approach to the re-evaluation of pesticides was presented by the PMRA to the Pest Management Advisory Council, to the Economic Management Advisory Committee and to other government departments for comments. As recommended in 1990 by the Pesticide Registration Review Team and accepted by cabinet, the re-evaluations will utilize reviews from other countries if they are up to Canadian standards.[179] The PMRA told the Committee that the assessments will incorporate considerations of US practices, as outlined in the US *Food Quality Protection Act*, and will address aggregate risk from all sources of exposure as well as cumulative risk for pesticides with similar modes of action when assessment methodologies become available. The PMRA will also be applying an increased safety factor for infants and children. It is expected that by 2005-06, all pesticides that were registered prior to 1995 will have been re-evaluated. The target for completion of the re-evaluations of organophosphate pesticides is December 2000.[180]

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[176] Report of the Commissioner of the Environment and Sustainable Development, Chapter 3, 1999.

[177] Canadian Environmental Law Association and the Ontario College of Family Physicians, Brief to the Committee.

[178] *Evidence*, Meeting No. 5, November 17, 1999; *Evidence*, Meeting No. 129, June 10, 1999; *Evidence*, Meeting No. 9, November 25, 1999.

[179] Pest Management Regulatory Agency, Proposed Amendments to the Pest Control Products Act, January 1999.

[180] *Evidence*, Meeting No. 126, June 1, 1999.

10.6 Given the unknown, and therefore potential, risks posed by pesticides, the Committee would ideally like to see the re-evaluations completed in as short a timeframe as possible. However, we respect that the evaluation process that is carried out in Canada will benefit from the evaluations conducted in the United States and other countries and we also do not wish to see the re-evaluation process hinder the registration of new and potentially safer alternatives. Given these two considerations, it is our position that completion of re-evaluations no later than 2006 is acceptable.

The Committee recommends that the re-evaluation program be adequately funded so that all pesticides registered prior to 1995 be re-evaluated no later than 2006.

10.7 The PMRA's directive on re-evaluation proposes a four-program approach. These four programs, in some ways, dictate the priority and/or speed with which reviews will be completed. For example, two of the programs will be tied to US priorities, progress and success. The PMRA directive also requests public involvement in setting priorities. The Committee is in agreement with most of the witnesses who have stated that children should be the primary focus of risk assessment and risk management activities. Priority for re-evaluation should be given to substances that are suspected of affecting fetal development and the health of children, especially neurotoxicants and endocrine disrupting substances.

10.8 The Committee recognizes that the re-evaluation of all pesticides that were registered prior to 1995 will require both human and capital resources. It remains unclear, however, how the PMRA is going to fund these re-evaluations. The Canadian Association of Physicians for the Environment indicated that funding sources must be made clear to ensure that funding is not an obstacle to the process.[181] The Canadian Manufacturers of Chemical Specialties Association and the Crop Protection Institute felt that the PMRA should avoid funding re-evaluations by shifting resources away from new product registration.[182] The former witnesses stated instead there should be an additional allocation of resources from the Treasury Board.[183]

Special Reviews

10.9 An additional mechanism for the re-evaluation of previously registered products is through special review. Special reviews on specific pesticides or groups of pesticides can be initiated in response to new information. For example, a special review of carbofuran was initiated in 1990 as a result of requests from Environment Canada scientists. This review resulted in the discontinuation of the granular form of this pesticide. Unfortunately no other special reviews have been initiated by PMRA since that time.[184]

10.10 Special reviews could be an invaluable tool for responding to concerns arising from post-registration monitoring or from the mandatory reporting of adverse effects that the PMRA is proposing. The PMRA is currently proposing that triggers and processes for re-evaluation and special reviews be articulated in the new Pest Control Act. They are proposing that the Act would state,

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[181] *Evidence*, Meeting No. 11, December 1, 1999.

[182] *Evidence*, Canadian Manufacturers of Chemical Specialities Association, Meeting No. 8, November 24, 1999; *Evidence*, The Crop Protection Institute, Meeting No. 9, November 25, 1999.

[183] *Evidence*, Meeting No. 8, November 24, 1999.

[184] Report of the Commissioner of Environment and Sustainable Development, Chapter 3, 1999.

among other things, that the Minister 'must initiate a special review if there is reason to believe that risks or value may not be acceptable' and 'must respond with a rational to a request from the public to initiate a special review.'[185] Scientific advancement or a request from the public could also trigger a special review. In addition to requirements for re-evaluation and special review, the new Pest Control Act should authorize the Minister to impose requirements regarding the disposal of pesticide stocks. This requirement would help avoid the long-term storage or dumping of de-registered pesticides.

10.11 Although the PMRA's proposals for special reviews are welcome, the new legislation should state that a special review must be initiated if there is reason to believe that the risks may not be acceptable, without specifying when or how this would be determined.

The Committee recommends that the new Pest Control Act contain provisions for special review of pesticide registrations, and that when a member country of the Organization for Economic Co-operation and Development (OECD) bans a pesticide for safety reasons such a review be mandatory.

10.12 The re-evaluation of all pesticides registered prior to 1995 is a monumental task. The re-evaluation of pesticides must not only be as thorough as the assessments that are currently conducted by the PMRA but must also take into account all relevant recommendations made in this report.

10.13 In order to avoid having backlogs of re-evaluations, the Committee believes that a systematic re-evaluation process is required. The US has a process for mandatory re-evaluation every 15 years.[186] With this is mind the Committee recommends that the longest time a pesticide should be registered for use without evaluation be 15 years. For example, if a product were registered in 2000, provided there were no special reviews conducted on that pesticide, it would automatically be reviewed again in 2015. If, however, a special review was conducted in 2005 then the pesticide could remain registered until 2020 before a mandatory re-evaluation would triggered.

The Committee recommends that the new Pest Control Act specify that, in the event that a pesticide has gone 15 years without being assessed, either through registration or special review, a re-evaluation by the Pest Management Regulatory Agency be required within one year.

10.14 The re-evaluation of pesticides is of top priority for the witnesses and for the PMRA alike. The combination of a rigorous and well-funded re-evaluation program and a system for special review will enable the PMRA to keep pesticides that are on the market up to date.

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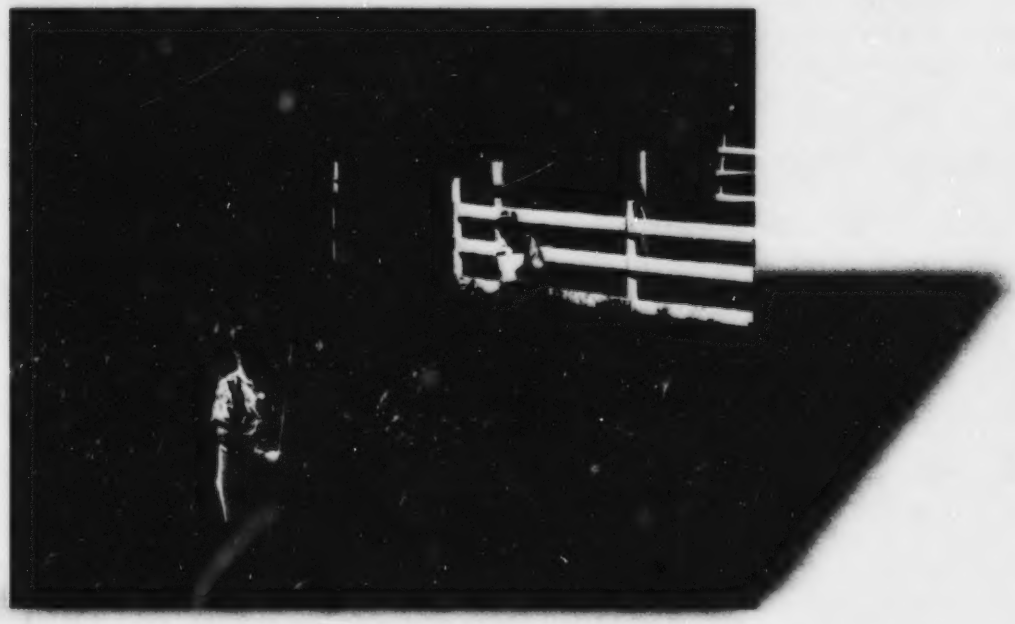
[185] Pest Management Regulatory Agency, *Proposed Amendments to the Pest Control Products Act*, January 1999.

[186] *United States Code*, Title 7, Chapter 6, section 136a(g)(1).

PART D:

PESTICIDE REDUCTION



11. ALTERNATIVES TO PESTICIDES

11.1 Integrated pest management combines the use of pest control methods (including pesticides) and alternatives to pesticides. Alternative pest management methods may be biological controls, but are not necessarily so. Plants which have been genetically modified to resist pests are one type of alternative pest management tool. Organic agriculture completely proscribes the use of chemical pesticides and genetically modified organisms, relying instead solely on natural or biological fertilizers. Witnesses described the current status of integrated pest management and organic agriculture in Canada, and in particular research and existing strategies in the field. They also questioned the current system of GST exemptions in the agricultural industry as well as the food grading system, and they suggested the possibility of introducing incentives for organic agriculture.

Integrated Pest Management

11.2 Integrated pest management consists of finding and using biological, chemical and other methods to reduce pest populations so that they cause less economic, sociological and ecological damage and so that agricultural systems are less wholly dependent on pesticides.[187] The idea is to combine the use of various compatible control measures such as:

- useful insects such as parasites and predators (biological management);
- bacteria, viruses and fungi (pathogens);
- insect- and disease-resistant plant varieties (including transgenic plants);
- synthetic hormones which inhibit the normal growth process;
- agricultural practices such as crop rotation and mixed farming; and
- behaviour-modifying chemicals and chemical ecology products (in particular pheromones, kairomones and allomones).

11.3 The Urban Pest Management Council explained to the Committee that integrated pest management calls for an assessment of all possible control options. The selection of a pest control method should be based on economic considerations and factors pertaining to effectiveness, public or worker health and safety, and on potential risks to property and the environment.[188] Integrated pest management measures are constantly improving in response to research conducted by specialized businesses in the field.[189]

11.4 According to Dr. Jeremy McNeil of Laval University, integrated pest management is preferable to organic agriculture because it is impossible to completely eliminate the use of synthetic insecticides in the short term. Pesticides are a cost-effective solution to certain specific problems of pest infestation. Concerted efforts by farmers, agri-businesses, researchers and the general public could help, however, to considerably reduce the overall use of insecticides in agri-ecosystems.

Integrated Pest Management Research and Strategies

Government Research

11.5 The Committee was informed about a number of integrated management research projects by federal departments. For example, Natural Resources Canada is conducting research on integrated forest pest management[190] and Agriculture and Agri-Food Canada (AAFC) is working on ways to reduce pesticide use in agriculture.[191] The Lethbridge Research Centre (AAFC) has a research program on integrated weed management on the Canadian prairies. The purpose of this program is to

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[187] J. McNeil, Supplementary information provided to the Committee.
[188] Urban Pest Management Council, Brief to the Committee.
[189] Crop Protection Institute, Brief to the Committee.
[190] *Evidence*, Meeting No. 127, June 2, 1999.
[191] *Evidence*, Meeting No. 128, June 8, 1999.

develop integrated pest management methods for grains, oilseeds and grain legumes grown in that region. Economic thresholds must be established to enable producers to determine when pest management is justified. Economic thresholds are ascertained with the aid of cost/benefit data on crop rotation, higher planting densities, local fertilizer spreading to help crops compete more effectively with weeds, the use of ground-covering plants, green fertilizers and ensiling for weed management.[192] Agriculture and Agri-Food Canada also allocates a portion of its budget for conversion to organic agriculture and education.

PMRA's Integrated Pest Management Program

11.6 The Pest Management Regulatory Agency (PMRA) encourages integrated pest management practices by facilitating access to those practices and coordinating integrated pest management (IPM) strategies in various sectors.[193] Together with the US Environmental Protection Agency, the PMRA has conducted a series of reviews of lower-risk pesticides and biopesticides.[194] There are two benefits for registrants: faster review of applications (one year instead of 18 months) and simultaneous registration decisions in both countries. In addition, costs are not recovered in order to encourage more interest in registration for biopesticides.[195]

11.7 The PMRA also coordinates the development of voluntary IPM strategies across the country in cooperation with various partners including: agricultural groups, manufacturers, federal departments, provinces, research institutions and non-governmental organizations. For the 1998-1999 fiscal year, the Agency's sustainable pest management budget was $865,000.[196] With this budget, the Alternative Strategies and Regulatory Affairs Division aims to develop and implement programs and policies integrating sustainable management in the Agency's decision-making process through risk reduction, integrated management, support for the use of biopesticides and low-risk chemical products. Although many other projects mentioned contribute to risk reduction and are part of a comprehensive policy (reviews of low-risk chemical pesticide, biopesticides, organophosphorus replacement products, integrated management strategies and so on), the Agency has no formal risk reduction policy.[197]

11.8 A number of organizations such as the Canadian Environmental Law Association (CELA), the Campaign for Pesticide Reduction, the Canadian Public Health Association and the Canadian Association of Physicians for the Environment, maintain that funding for the sustainable pest management program is insufficient to comply with all the commitments of the program and must be revised upwards. Similarly, the Canadian Association of Physicians for the Environment and the Canadian Environmental Law Association emphasized to the Committee that these future resources should be accompanied by a clearly defined PMRA action plan. The Agency should therefore draft a policy with the primary objective of reducing pesticide use. This objective should be in all its activities and decisions be related to this policy. The Agency should reassess its integrated pest

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[192] Lethbridge Research Centre, Agriculture and Agri-Food Canada, Brief to the Committee.

[193] Pest Management Regulatory Agency, Web site, December 1999.

[194] *Evidence*, Meeting No. 126, June 1, 1999.

[195] Pest Management Regulatory Agency, Web site, December 1999; C.A. Franklin, supplementary letter to the Committee, February 17, 2000.

[196] C.A. Franklin, correspondence to the Committee, August 24, 2000.

[197] C.A. Franklin, correspondence to the Committee, February 14, 2000.

management program to ensure that reduced pesticide use and the development of biological methods are fixed as priorities.[198] The registration process should also reflect the policy's objective. For example, the existence of a lower-risk alternative to a pesticide could result in a refusal to approve a product. This objective should also serve as a guide to the use of approved pesticides. According to Mr. Paul Muldoon, Executive Director of CELA,

> ...The way we looked at this was that of having an agency trying to act in the public interest. We looked at it not from the point of view of what they are doing right and what they are doing wrong, but what the systemic barriers are that are perhaps not allowing them to protect further the public interest. That's why we looked at the legislation, the policy bases, and the resources. In my mind, in trying to fulfil the mandate appropriately, the question is what the things are that can be done to enhance the mandate in the right direction, such as integrated pest management.[199]

11.9 The Committee believes that these are very relevant suggestions that would enable the PMRA to carry out its mandate more effectively and thus further protect the environment and health of Canadians.

The Committee recommends that the Pest Management Regulatory Agency, in conjunction with other relevant departments and educational institutions, favour a reduction of pesticide use, develop alternatives to pesticides and promote integrated pest management by:

(a) developing a pesticide use reduction policy and implementing it in all its activities, including the registration process; and

(b) revising its integrated pest management program.

The Committee recommends that the government allocate appropriate funding year after year to permit full implementation of the Agency's integrated pest management program.

Agricultural Sector Involvement

11.10 The Committee was informed that farmers are helping to reduce pesticide use and promote integrated pest management. According to the Canadian Federation of Agriculture (CFA), Canadian farmers are leading the way when it comes to sustainable practices by using, for example, methods designed to protect the soil.[200] These methods afford environmental benefits (reduced fuel consumption, soil erosion and compaction, increased crop yield and organic matter in soil). Increasing numbers of farmers and specialized producer groups are taking part in integrated pest management programs using, for example, combined biological, crop, physical and chemical methods to optimize integrated management benefits and minimize health and environmental risks.

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[198] P. Stonehouse, Ph.D., University of Guelph, letter sent to Geraldine Graham, PMAC Secretariat, Health Canada, February 19, 1999; J. H. Borden, Professor, Simon Fraser University, correspondence to Dr. R. J. Van Loon, Chair, Advisory Council, Pest Management Advisory Council, February 24, 1999.

[199] *Evidence*, Meeting No. 11, December 1, 1999.

[200] Canadian Federation of Agriculture, Brief to the Committee.

Farmers favour these sustainable agricultural practices because they are aware of the effects that pesticides have on their own health and that of their families. According to the CFA, Canadian farmers currently use only the minimum quantities of pesticides necessary for agricultural production purposes and this situation is partly due to the fact that integrated pest management has become standard practice. The Federation added that the quantities of pesticides used per square kilometre of cultivated land are comparable to those employed in Europe and the United States.

11.11 The Crop Protection Institute emphasized that farmers have nothing to gain by using more than the required quantity of pesticides as they seek to reduce their production costs and preserve the environment for future generations. The Institute believes that more recent products are less harmful to the environment (less toxic for human beings, more specific, more biodegradable, decreased necessary quantities).[201]

11.12 The Canadian Federation of Agriculture (CFA) noted that it appreciates the strict Canadian regulatory system, but criticized the fact that the registration process is too slow, delaying the registration of new products which, in the Federation's view, are more ecologically sound. The Prince Edward Island Ministry of Technology and the Environment agreed on this point, emphasizing that the approval of low-risk pesticides is a priority.[202] (See Chapter 15, "Institutional Changes," regarding the recommendation on the PMRA's priorities, particularly the development of pest control products that are safer for the environment and human health.)

11.13 Nature-Action Québec is implementing projects that prove biological pest control methods have a promising future, provided the environment's natural biodiversity is respected and the necessary energy is expended to develop the public's perception of those methods. The organization, which for a number of years has been increasing public awareness of the benefits of environmentally safe lawns (Appendix 11.1), convinced Committee members that these types of approaches are feasible in both horticultural and urban environments. Alternative methods help to protect rather than degrade the environment, a fact that should be considered by those who determine the profitability of ecological methods relative to traditional methods. The Committee supports organizations such as Nature-Action Québec, Action Chelsea for the Respect of the Environment, Citizens for Alternatives to Pesticides and the Canadian Association of Physicians for the Environment in their bid for financial resources for research and dissemination of information to Canadians respecting alternative methods. By information, we mean both providing information to professional pesticide users and increasing the awareness of the general public with regard to alternatives.

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[201] Crop Protection Institute, Brief to the Committee.

[202] Prince Edward Island Ministry of Technology and Environment, Brief to the Committee.

Examples of Biological Management

The methods with a high potential for success in managing the apple curculio are: planting orchards so as to reduce sources of curculio infestation; mechanically striking branches to dislodge curculios; the use of insect pathogenic fungi.

The methods for apple fruitworm control include the use of viruses and mating confusion.

- By encouraging natural enemies and through the use of insect pathogenic fungi, biological management should be the favoured method for managing the tern stink bug.
- Apple maggot populations can effectively be reduced by placing baited red spheres in orchards and regularly gathering apples that have fallen to the ground.
- The best strategy for the red spider and temperate red spider mite is to eliminate or limit the use of broad-spectrum insecticides so as to promote the action of natural enemies.
- Lastly, the methods with a high potential for success against the scab are the use of resistant varieties, mineral fungicides and scab enemies.

(Update on main alternative apple growing methods in Quebec, research conducted for the ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) by Nature-Action Québec, November 1999.)

11.14 Like a number of witnesses (including the Working Group on the Health Dangers of the Urban Use of Pesticides, the Campaign for Pesticide Reduction and the Canadian Public Health Association), the Committee believes that increase availability of alternatives to pesticides will reduce the public's risk of exposure to these products and promote a reduction in their use. Consequently, additional funds should be allocated to developing alternatives and making them available to the public. Alternatives such as integrated pest management are worth promoting. The Canadian Public Health Association believes that alternatives to pesticides are, among other things, realistic ways of reducing the adverse health effects of these products. Although integrated management does not completely eliminate the use of pesticides, it does make it possible to put a stop to the use of certain particularly toxic products.

The Committee recommends that, to protect the environment and human health:

(a) the government allocate appropriate financial resources to integrated pest management research and public information and, in particular;

(b) Agriculture and Agri-Food Canada increase research into alternatives to pesticides and formulate pest management strategies.

The Committee recommends that the government, in co-operation with its provincial and territorial partners, establish a national alternatives-to-pesticides data base and that it be made available to the public through an electronic registry.

11.15 Similarly, the Committee believes it is possible to promote alternatives to pesticides by changing the name of the existing *Pest Control Products Act* with the new Pest Control Act. The Canadian Environmental Defence Fund and the Commissioner of Environment and Sustainable Development recommended that action be taken to correct the federal government's inability to promote the development of alternatives to pesticide use. The principle of pesticide substitution

should therefore be included in the new Pest Control Act, as is done in Sweden. In 1990 the Swedish legislation on chemical products was amended to include a definition of the substitution principle which reads, "Anyone handling or importing a chemical product must take such steps and otherwise observe such precautions as are needed to prevent or minimize harm to man or the environment. This includes avoiding chemical products for which less hazardous substitutes are available." According to this definition, if a new pesticide is registered that is safer than an older one, the older one automatically loses its registration.[203] Failure to apply the substitution principle is a violation of law in Sweden. Subsequently, the Swedish Parliament passed an Environmental Code which came into force on January 1, 1999. Fifteen pieces of legislation were amalgamated in the Environmental Code, including the legislation on chemical products act.[204] The substitution principle is now called the "product choice principle" and is defined as follows:

> Everybody who is to take a measure must avoid using or selling chemical products or biotechnical organisms that can harm human health or the environment, if these may be replaced with such products or organisms that may be assumed to be less hazardous. Corresponding requirements apply to goods containing or which have been treated with, a chemical product or biotechnical organism.[205]

11.16 In the Environmental Code, a chemical product includes a product that has been specially produced to act as a pesticide, or for some other technological purpose, or which completely or partially consists of living micro-organisms, nematodes, insects or spiders. The Code also states that the product choice principle applies not only to commercial sale and use, but also to individuals. The Committee is of the opinion that Canada should put Sweden's experience with pesticide management to good use. Specifically, the PMRA should withdraw the registration of a pesticide when a less toxic product or procedure, or a non-chemical process, becomes available.

The Committee recommends that the substitution principle included in Sweden's new Environmental Code be defined in the new Pest Control Act and that the Pest Management Regulatory Agency apply the substitution principle in order to promote the replacement of pesticides with less toxic products and non-chemical measures.

Organic Agriculture

11.17 Organic agriculture proscribes the use of chemical pesticides and relies instead on natural and organic fertilizers. Organic agricultural practices are designed to re-establish and preserve ecological stability in the environment. For this purpose, soil fertility systems must maintain maximum biological activity in the soil and conserve natural resources. Pest management is carried out using biological, cultural and mechanical methods including mechanical tillage, crop rotation, residue recycling, water management, increasing beneficial insect populations, and the promotion of biodiversity. The primary goal of organic agriculture is to promote and develop sustainable environmentally friendly farming.[206] According to Dr. Peter Stonehouse of Guelph University, there

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[203] Excerpt from *Rachel's Environment & Health Weekly*, No. 670, September 30, 1999.

[204] Extract from the Environmental Code of Sweden, documentation from the Swedish Embassy, March 2000.

[205] Personal communication, The Environmental Code of Sweden, extract, March 2000.

[206] Canadian General Standards Board, *Organic Agriculture*, National Standard of Canada, Standards Council of Canada, CAN/CGSB-332.310-99, 19 p. + appendices.

are a number of reasons to take an interest in organic agricultural methods. Dr. Stonehouse has written a number of articles on the economic and environmental benefits of organic agricultural businesses. Organic agriculture, he says, was developed in order to solve the problems caused by conventional agriculture. The problems he refers to include soil erosion and degradation, non-point source pollution and deteriorating wetlands.[207] Organic farming causes less damage to the environment for at least three reasons:

- not using pesticides and synthetic fertilizers eliminates the potential for damage to the environment from those sources;

- the absence of synthetic fertilizers forces farmers to observe the soil conservation ethic of maintaining and recycling soil nutrients on their lands, thus reducing the risk of pollution in the area surrounding their farms; and

- emphasis is placed on soil recovery in winter through the use of forage crop plants, winter grains and ground-cover plants, which improves soil condition and reduces the risk of erosion, degradation and compaction.

Apart from protection of the environment, biodiversity and ecological equilibrium, organic agriculture is designed to respond to concerns about food quality, human health and animal welfare. It is also intended to protect natural resources and maintain the ecological viability of agriculture.[208]

11.18 Organic farming is a niche market in Canada which has been growing at an annual rate of 20% in recent years.[209] According to the Canadian Organic Advisory Board, Canadian organic production totals nearly $1 billion per year. This trend is all the more surprising since, prior to June 1999, there was no national organic production standard. The organic products market in Canada is dominated by imports from the United States and Europe (80%). The Canadian Organic Advisory Board (COAB) estimates that 85% of Canadian organic production is exported and that demand for certain products, in particular grains and oilseeds, is exploding.

The Situation in Other Countries

- At present, although organic farming is still a marginal sector, it occupies nearly 2% of all EU farmland and over 1% of farms; percentages vary a great deal from one country to another (12% of farms in Sweden; 9% in Austria; 4% in Finland).
- Denmark is a good example of a European country that has adopted a policy on organic farming. In February 1999, Denmark's Minister of Health, Agriculture and Fisheries announced an action plan that would continue to support Denmark's organic farming sector into the 21st century, and proposed US$ 338 million in funding for both production and marketing for the five-year period from 1999 through 2003. The action plan calls for 10% of Danish farmers to use organic methods by the year 2003, tripling Denmark's current organic production. In 1998 in Denmark, approximately 2,500 farms used or were converting to organic methods — double the number doing so in 1996 — and some 99,000 hectares or 3.7% of farm acreages were being farmed organically. With the addition of these converted farms and acreages, it is expected that in 1999 these figures will increase to 3,300 farms and 150,000 hectares. Denmark's main organic products are meat, eggs, vegetables, grain, and dairy products: approximately 20% of milk produced in Denmark is organic. The average acreage of an organic farm in Denmark is 38.5 hectares, which is comparable to the size of a traditional Danish farm.

(Eurostat news release; see also complete report "Agriculture, Environment, Sustainable Development Facts and Figures: A Challenge for Agriculture, 1999," US Department of Agriculture, Foreign Agricultural Service (FAS) Online, March 1999.)

[207] Y.O. Sheba, P. Stonehouse and E.A. Clark, "Environmental and Economic Benefits of Organic Dairy Farming in Ontario," *Environmental Management*, p. 151-156; R.S. McDonald, Executive Director, Canadian Organic Advisory Board, Brief to the Committee.

[208] *Evidence*, Meeting No. 13, December 7, 1999.

[209] U.S. Department of Agriculture, *FAS Online*, Web site, March 1999.

Canadian National Organic Agriculture Standard

11.19 The Canadian National Organic Agriculture Standard was announced by the Government of Canada on June 29, 1999. The standard defines the term "organic" and is designed to reinforce production as well as the principles and practices of ecological management that apply to organic farming. The standard places emphasis on recycling and promotion of biodiversity and also covers the period of conversion to organic farming, production plans and files, plant and animal production, production requirements for maple products, honey, greenhouse crops, mushrooms, sprouts, wild and natural products as well as production and processing, packaging, labelling, storage and distribution of organic products. This new standard was drafted with the Canadian General Standards Board (CGSB) and is voluntary. At present, there is no federal policy aimed specifically at the organic industry. However, the Committee believes that federal government involvement beyond the adoption of a voluntary standard is necessary.

Goods and Services Tax

11.20 In their presentation to the Committee on December 13, 1999, the authors of the book "Real Food for a Change" claimed that the input tax exemption enjoyed by farmers would encourage them to use pesticides:

> Chemically dependent farmers are currently receiving many subsidies that are not available to organic farmers. Farmers do not pay GST on pesticide purchases, for example, which is a 7¢-on-the-dollar assist to chemical dependency.[210]

11.21 However, the Committee was subsequently informed that virtually all agricultural inputs (tools, machinery, crop seed, etc.) are tax exempt, not only pesticides. Consequently, all farmers enjoy a tax exemption on inputs, whether they engage in conventional or organic agriculture, grow field crops or raise livestock, manage small or large agri-businesses.[211] Furthermore, the exemption from the GST on all inputs is not a 7¢-on-the-dollar benefit for farmers in using pesticides. Farmers do not pay the GST on their inputs and do not have to bill it when they sell their products. When the GST was introduced, the federal government decided that food would be tax exempt and that food producers such as farmers should therefore also benefit from this tax measure. Changing this tax measure respecting agricultural inputs would mean restarting the debate over whether the GST should be charged on food products. No witness made this suggestion.

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[210] W. Roberts, R. MacRae and L. Stahlbrand, Brief to the Committee.

[211] J.D. Fréchette, *Pesticides and the GST*, Parliamentary Research Branch, Library of Parliament, February 3, 2000.

Tax Incentives for Organic Agriculture

11.22 According to the Canadian Organic Advisory Board, sustainable pest management strategies can be promoted in various ways. Some European countries offer tax incentives to farmers to encourage them to eliminate pesticides and synthetic fertilizers with the aid of programs that have been integrated into agricultural and environmental policies.[212] For example, entire valleys in Austria have been converted to organic agriculture as a result of European Union funding. Between 1991 and 1996, the number of Austrian organic farms increased to the point where they now represent half of all organic farms in Western Europe (see text box).

Conversion to Organic Agriculture in Europe

- From 1991 to 1996, the number of organic farms in Austria increased from 1,500 to 23,000 and the area in organic production from 17,000 to 225,000 hectares.
- The EU's objective for the year 2000 is 2.5%; Austria's objective is 20%. The last decade has witnessed a mini-boom in organic farms as a result of European incentives.
- The number of certified farms in Western Europe increased from 10,000 to more than 50,000 between 1987 and 1997.
- The area of land under organic cultivation has increased eight times.
- Half of this land is being converted to organic agriculture with the aid of the National and European Funds.

(Tamara Thiessen, "It's not easy being green, EU Finds", *The Gazette*, Montreal, Tuesday, February 15, 2000)

11.23 The increase in the amount of farm land converted to organic agriculture has been observed in Europe is a result of this type of incentive, together with an increase in the volume of certified organic products destined for foreign markets. Committee members are concerned by the fact that Canada's organic agricultural sector enjoys no subsidized promotion programs. Such tax incentives would encourage the transition to organic agriculture, particularly if they were part of a federal policy.

The Committee recommends that the government develop an organic agriculture policy for the transition from pesticide-dependent farming to organic farming. This policy should include tax incentives, an interim support program during the transition period, technical support for farmers, the development of post-secondary organic farming programs and enhanced funding for research and development (R&D) in organic agriculture.

Food Grading System

11.24 Some Committee members also expressed concern at witnesses' assertions that the present food grading system encourages farmers to use pesticides:

> Grading systems that are enforced by federal and provincial governments place an arbitrary and artificial price premium on supermodel, cosmetically perfect food. Grade A has nothing to do with nutrients; it is purely a cosmetic grading, and grading thereby becomes an incentive for excessive pesticide use.[213]

[212] R. McDonald, Canadian Organic Advisory Board, Brief to the Committee.

[213] W. Roberts, R. MacRae, L. Stahlbrand, Brief to the Committee.

11.25 Witnesses explained, for example, that apple growers may make as many as 16 applications of pesticides per year to combat apple scab although this fungus, in small quantities, has little effect on the fruit's nutritional value. Producers, they said, are tempted to use more pesticides because one harvest may be graded lower if it shows minor (visual) damage and thus bring a lower price.[214] One witness, therefore, recommended that the present grading system be changed so that it is no longer based on visual aspects, but rather the nutritional value of the consumer product and thus, indirectly, on reduced pesticide use.

11.26 On the one hand, the witness suggested that pesticide-free foods have a less attractive appearance, which is not necessarily true. On the other hand, the grading system which is applied to both organic and conventional products, meets international requirements. If Canada were to deviate from it, the entire international system for harmonizing and comparing standards would have to be reviewed. Although the grading system is part of a national policy, it serves above all to facilitate trade between Canada and its trading partners. Changing the grading system as proposed would mean changing the ground rules of international trade.

11.27 Labelling would thus appear to be the way to provide consumers with nutritional information on products and other types of information such as the use or non-use of pesticides. Certain types of labelling already tell consumers whether a product has been organically produced. Once the recently adopted "Canada Organic" standard can be granted by a nationally recognized certification organization, Canadian and foreign consumers will have additional assurances as to the organic nature of products.

11.28 Since consumers have more contact with the labelling system than the grading system, it seems logical to improve Canada's labelling system so that it can inform consumers adequately. In this way, consumers may choose foods on the basis of their nutritional value and organic nature rather than their appearance.

The Committee recommends that the government work with industry to quickly put in place a certification organization for the *Canadian National Organic Agriculture Standard*.

The Committee recommends that the food labelling system be improved to provide consumers with better information on the intrinsic nutritional qualities of food products.

Organic Agriculture Research

11.29 A number of organic agriculture research projects are being carried out within the federal government. For example, a team from the Lethbridge Research Centre is developing techniques to produce crops that do not require pesticide use.[215] Government research in the field, however, does not appear to be a priority in Canada. The situation scarcely seems any better in the universities, where students do not have access to appropriate courses in organic agriculture. The following comments by

[214] R. MacRae, correspondence to the Committee, February 2000.

[215] R.E. Blackshaw, Agriculture and Agri-Food Canada, Lethbridge Research Centre, Alberta, Brief to the Committee.

witnesses Dr. Stonehouse and Dr. McNeil, respectively, reflect the concerns of a number of experts who addressed the topics of research and education as a whole:

> Research support for organic farming systems is just about zero in this country — just about zero... Moreover, it's so at variance with what we're teaching students in the agricultural colleges according to the conventional method of production across the country that it's totally foreign to begin thinking about organic farming systems. There aren't any courses on organic agricultural production systems — biologically, economically, or sociologically — at the University of Guelph. We don't have any at all.[216]

> At Laval, since I got there in 1972, I've been teaching to agronomists an integrated pest management course that was always there. I think there has to be change, quite frankly, in our educational system, if we have agronomists and biologists coming out who don't understand the concepts of the systems we're supposed to be managing, and they've been presented with the ups and downs.[217]

11.30 The Canadian Organic Advisory Board had a similar view. In the Board's view, it may be seen from a comparison between the Canadian and European situations that there is little data on many aspects of organic production in Canada and regional specialists are scarce.[218] In view of these obvious deficiencies in training and availability of scientific expertise, the Committee is convinced of the importance of helping and supporting the organic agriculture field.

> **The Committee recommends that the government grant appropriate financial resources for research, teaching and information distribution in the organic agriculture sector.**

11.31 In the Throne Speech in October 1999, the Governor General announced the creation of 2 000 research chairs as part of the 21st Century Chairs for Research Excellence Program.[219] This announcement was confirmed by the Minister of Finance when he tabled his budget on February 28, 2000:

> Second, we will follow through on the commitment made in the Speech from the Throne to create new 21st Century Chairs for Research Excellence.
>
> These will be new research positions at Canadian universities, designed to attract the best researchers from around the world and to retain the best from across Canada.To this end, this budget provides $900 million of funding over five years for 2 000 new research chairs.[220]

11.32 The Committee applauds this initiative, which will help consolidate innovation systems across Canada, and sees this as an outstanding opportunity for the government to promote research in organic agriculture.

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[216] *Evidence*, Meeting No. 13, December 17, 1999.

[217] Ibid.

[218] R.S. McDonald, Executive Director, Canadian Organic Advisory Board, Brief to the Committee, correspondence from the Board to the House of Commons Agriculture Committee, June 3, 1999.

[219] Association of Universities and Colleges of Canada, *New Research Chairs Important and Innovative Building Blocks*, Press Release, October 13, 1999.

[220] Minister of Finance, the Honourable Paul Martin, P.C., M.P., Hansard, February 28, 2000.

The Committee recommends that the government create research chairs in organic agriculture.

11.33 Organic agriculture is a vast sector, as may be seen from the number of topics addressed as part of the study on pesticides. A number of other themes could be developed in greater depth including the economic and environmental aspects of organic agriculture, biological pest management techniques, the study of the "Canada Organic" standard and development of future organic agriculture legislation. These subjects deserve further attention as part of future research efforts.

The Committee recommends that, within six months of the tabling of the government response to the present report, a special committee composed of members of the Standing Committees on Environment and Sustainable Development, Agriculture and Agri-Food, and Foreign Affairs and International Trade, be formed to conduct an in-depth study on organic agriculture in the domestic and the international context and to make recommendations to the government.

Appendix 11.1
The Environmentally Safe Lawn

Based on Nature-Action Québec's expertise, a beautiful lawn can be achieved without chemicals using the following tips:

- Ensure soil is well prepared. Good arable land is essential in order for grass to become deeply rooted and flourish for many years. The soil must be well turned to 15 or 20 cm in depth, with the organic matter and minerals essential to good growth added. Unfortunately, most lawns are installed hastily on compacted earth from excavation.

- Plant the right species in the right place. Lawns are made up of plants that require sun and a great deal of water. In shady areas, it is better to plant species that tolerate shade. However, certain species are also more resistant to dry conditions and treading. If conditions are too harsh for grass, ground covers or other treatments should be considered.

- Ensure adequate maintenance. Regular or seasonal care will keep lawns dense and in good condition. This includes fertilization, cutting, watering, aeration and so on. These are all minor tasks that must be performed adequately and at the right time to ensure a vigorously growing lawn. Most people cut their lawns too short, resulting in lawns that are more sensitive to dry conditions and parasites.

- Accept diversity as an integral part of a healthy environment. A lawn is not an artificial carpet. It is a living area which contains a host of inoffensive and even highly useful organisms (plants, insects and earthworms).

- Understand that infestations are merely symptoms of an underlying problem. It is not a good idea to apply pesticides (even organic ones) repeatedly in order to solve this kind of problem. It is better to correct it at the source, even if that means replacing the lawn with something more suited to the environment. The best weapon against infestation is prevention and maintenance of a diversified environment in which competition among organisms prevents domination by any single one.

Source: Nature-Action Québec, Brief to the Committee

Appendix 11.2
Alternative Ecological Solutions

Pest control on the farm	Pest control in the home garden
Companion planting entails the growing of two species of plants together, one chosen because it repels pests that would attack the other.	**Companion planting** works very well in home gardens. Many insects avoid garlic, chives, mint, anise, coriander, geraniums, nasturtiums and many other plants. For example, plant one of these species near your rosebushes and it will keep aphids off.
Crop rotation (planting different crops on the same land at different times) can eliminate a pest by removing its host for at least one growing season.	**Crop rotation** also works well in a home garden. Pests that infest potatoes, for example, may not survive a season in which onions are grown in the potato patch instead.
Sex attractants can be used to frustrate and confuse breeding adults in the quest for mates. **Food attractants** can be used to lure and trap pests.	Some gardeners enlist the help of **wildlife** and **domestic animals**. Domestic ducks, for example, relish most of the weeds that grow in strawberry and cabbage patches. Fennel attracts tiny wasps that both fertilize flowers and are parasites to many insect pests. Bird houses and flowering shrubs help attract some insect-eating birds to the home garden.
Selective breeding encourages plants that resist particular pests — rust-resistant wheat, for example.	Some **natural substances** can be used as traps. A brew of molasses and lemon juice in water, for example, will attract and drown earwigs. Slugs react the same way to beer or honey. A mixture of peanut butter and boric acid will attract and kill carpenter ants.
Natural predators can be introduced to compete with harmful insects.	Many **natural "teas"** are effective pesticides and insect repellents. These include brews made from rhubarb, onion, garlic and soap. They can be spread on the ground, brushed on tree trunks or sprayed directly on plants.
Mechanical or manual weeding and **tilling** are simple age-old methods that also have the advantage of reducing soil erosion and compacting, and increasing yield and the quantity of organic matter in the soil.	

Sources: Agriculture and Agri-Food Canada, Web site, *Environmental Sustainability of Canadian Agriculture: Report on the Agri-Environmental Indicators Project*, March 2000; Environment Canada Web site, April 2000

12. URGENT NEED FOR ACTION: AWARENESS, REDUCTION, PHASE OUT

12.1 The Committee has made a number of disquieting observations regarding the possible effects of pesticides on vulnerable population groups, most notably children. The members have realized that there is a lack of scientific information, and this has led them to the conclusion that the precautionary principle must be applied and that scientific research must be continued and promoted. The Committee also noted that there are alternatives to pesticides. The Pest Management Regulatory Agency (PMRA) has an integrated pest management program, farmers are already implementing the principles of organic farming, some environmental agencies are working on alternatives to pesticides that are tailored to the urban environment or the agricultural sector. Some tools already exist, others must be developed, and those that are already available must be improved and promoted. The Committee also believes that the general public can play an important role in reducing pesticide use. Consider, for example, the increasing number of municipalities which are working to adopt by-laws on pesticide use. This type of action is generally taken in response to requests from and lobbying by citizens. But much remains to be done to raise awareness among the general public about health risks due to pesticides. The witnesses explained how informing those who use pesticides and the public in general is a prerequisite for a good pesticides management system.

The Importance of an Awareness Campaign

12.2 According to information provided by the Urban Pest Management Council of Canada, most Canadian municipalities are already taking part in integrated pest management programs.[221] As of 1999, however, only the province of Quebec had given municipalities the power to establish by-laws governing the use of pesticides in their municipality. As a result, some Quebec municipalities have begun to prohibit the use of chemical pesticides within their boundaries. For instance, as the Federation of Canadian Municipalities informed the Committee, the municipalities of Chelsea and Hudson adopted by-laws prohibiting pesticides within their boundaries.[222]

12.3 The Committee applauds the initiatives that have been taken by various Canadian municipalities. In Ontario, the City of Waterloo's Plant Health Care Program enables the municipality to reduce the amount of pesticides used to maintain its green spaces. Ottawa-Carleton now has an interim pesticide use protocol which was developed in co-operation with the Sierra Club of Canada. The town of Dundas has adopted a zero pesticide use policy for the year 2000.[223]

12.4 In the Committee's view, these few examples show that it is possible for Canadian society to evolve towards a reduction in pesticide use. We are currently witnessing an increase in public interest in the pesticides issue. The Committee believes that it would be timely to organize a national pesticide information campaign for Canadians. The campaign would provide information about pesticides, about alternatives, about the health risks involved in using pesticides, and about their role in certain sectors such as agriculture. Committee members learned that those who work with pesticides should, for their own protection, be well-informed. A number of witnesses also emphasized the fact that, to protect children, parents have to be well-informed. As children grow up they are likely to be exposed to pesticides in many locations, inside their homes as well as outside. If parents are informed about the risks associated with the application of these products in their surroundings, chances are that their use of pesticides will change. For children, the environment is not any safer outside the home; the majority of Canadian children live in an urban environment, where pesticide use for esthetic purposes is on the rise. It is of the utmost importance that all governments be made aware of the risks involved in applying pesticides in a public park, for

Pesticide Reduction in Ontario
A Few Figures

Ontario farmers have reduced their use of agricultural pesticides by 40.7% since 1983, when Ontario introduced the program aimed at a 50% reduction in pesticide use by the year 2002.

Since 1992, as part of the Ontario Waste Agricultural Pesticides Collection Program, more than 35,000 kgs and 59,000 litres of unwanted or unusable (outdated, deteriorated or contaminated) pesticides have been brought into 26 collection depots and disposed of.

(AGCare (Agricultural Groups Concerned About Resources and the Environment))

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[221] Urban Pest Management Council of Canada, Brief to the Committee.

[222] Municipal authorities have sufficient powers to protect residents' health and safety and to legislate against nuisances. According to some lawyers, this enables them to prohibit the use of pest control products. The Court of Quebec has proven to be of this view and has supported the efforts made by the town of Hudson to prohibit pesticides within municipal boundaries. (Hudson's prohibition provided for exemptions for pest control products used inside buildings, biological herbicides, and products and other organisms that do not pose a threat to human health.)

[223] Federation of Canadian Municipalities, Brief to the Committee.

instance, some municipalities have decided to take action, and Action Chelsea for Respect of the Environment (ACRE), which appeared before the Committee on November 30, 1999, believes that the Canadian government should show the same degree of initiative as the municipalities of Hudson and Chelsea have shown in protecting the environment and the health of Canadians.[224] The Committee approves of this view since pesticides know no boundaries. Under a national pesticides awareness campaign, similar to the tobacco campaign, the federal government could implement a variety of measures: Health Canada could be responsible for the project, the awareness campaign could receive permanent funding, appropriate labels could be developed for pesticide packaging (listing all ingredients, giving percentages of total volume, PMRA product evaluation date, warnings, and so on) and organic pest control and lawn maintenance methods could be promoted. The federal government would be sending a clear signal that it is genuinely concerned about the health of Canadians.

The Committee recommends that the government introduce a comprehensive national awareness and information campaign on pesticides.

Pesticide Reduction at the Federal Level

12.5 The Committee is of the opinion that the government could show even greater initiative by setting an example of good pesticide management within its "own house." In other words, the government should make pesticide reduction one of its own main priorities. In view of their considerable supply and service acquisition activity, federal departments and agencies are doubtless major users of pesticides. They should have a greater obligation to report on their pesticide use. For instance, all government bodies, including the parapublic sector, could provide a model to follow by reporting to Parliament on their use of pesticides and by developing concrete pesticide use reduction strategies. Reporting and strategy development could be included in the sustainable development strategies that all ministers have had to prepare for their departments and table in the House of Commons since 1995, when the *Auditor General Act* was amended. Canadians should be able to find out about actions taken by the federal government, whether for maintaining transportation routes or keeping access to power transmission lines open, or for park maintenance.

The Committee recommends that the government, including departments, federal councils and agencies, Crown corporations listed in Schedule III of the *Financial Administration Act*, federal regulatory agencies, and federal lands, pursuant to the new Pest Control Act legislation:

(a) report to Parliament on all its uses of pesticides, through the sustainable development strategies, indicating the type and amount of pesticides used, when and where; and

(b) establish pesticide use reduction plans.

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[224] Action Chelsea for Respect of the Environment, Brief to the Committee.

12.6 Once the government has provided information to Canadians, and once it has reduced its own pesticide use, a third step can be contemplated. The Committee feels it would at that point be possible to implement a national pesticides reduction plan, that would involve all levels of government working together to achieve this objective. Past experience has shown that the federal government, its provincial and territorial partners and the private sector work well together on joint projects. The National Packaging Protocol is a case in point. The federal government could be guided by the action plans developed by European countries and referred to in this report to promote organic farming. The approaches developed by Denmark and Austria are of particular interest.

The Committee recommends that the federal government develop and adopt, with the assistance of its provincial and territorial partners and with the private sector, a national pesticide reduction protocol similar to what has been done in Europe and modelled on the National Packaging Protocol developed by the Canadian Council of Ministers of the Environment.

Gradual Reduction in the Use of Pesticides for Cosmetic Purposes

12.7 The Committee is convinced that, once Canadians are aware of the consequences of pesticide use in the environment, there will be a gradual reduction in pesticide use for cosmetic purposes in urban areas. A reduction of pesticide use in Canada can only be achieved if the general public is informed. The support of consumers, producers and retailers is necessary if pesticide use is to be reduced.

12.8 A number of witnesses informed the Committee that they are opposed to pesticide use for esthetic purposes in urban areas. According to the Working Group on the Health Dangers of Urban Pesticide Use, Nature-Action Québec, Citizens for Alternatives to Pesticides and the Campaign for Pesticide Reduction, pesticides are used principally for esthetic purposes in urban areas and this poses an unnecessary risk for those applying the products and the general public. It cannot be emphasized enough that children at all stages of growth are the primary victims of our overuse of chemicals. As many of the effects of exposure to pesticides are chronic, they may well suffer the consequences of exposure all their lives and even pass this on to the next generation. The Committee firmly believes that a moratorium on pesticide use for esthetic purposes is necessary until science has proven that the pesticides involved do not constitute a health threat and some light has been shed on the consequences of their use in urban areas. Pesticide use should only be permitted in an emergency, such as a serious pest infestation which threatens the health of people and the environment.

The Committee recommends that the new Pest Control Act prohibit the registration and re-registration of pesticides intended for cosmetic uses.

The Committee urges the government, in partnership with the provinces, territories and municipalities, to develop a strategy for the gradual phase-out of pesticides used for cosmetic purposes.

PART E:

A MORE OPEN AND TRANSPARENT PROCESS

13. INFORMING AND INVOLVING THE CANADIAN PUBLIC

13.1 The Commissioner of the Environment and Sustainable Development remarked in his 1999 report that the PMRA had gained the reputation of being a "closed shop."[225] This characterization was echoed by witnesses before the Committee. The Canadian Manufacturers of Chemical Specialities Association, for example, stated that "because of the 'closed shop' approach of the PMRA, we all have been left in the dark as to what the Agency is doing."[226] While this comment was made specifically in reference to the PMRA's ever-changing policy on the re-evaluation of older pesticides, the Committee is satisfied, based on the evidence before it, that this criticism is generally applicable. We agree with the observations of the Canadian Environmental Defence Fund, which indicates:

[225] Report of the Commissioner of the Environment and Sustainable Development, Chapter 3, 1999.
[226] Canadian Manufacturers of Chemical Specialties Association, Brief to the Committee.

> Public involvement in the decision-making process of registration is at an unacceptable level by today's standards of accountability and transparency. The federal government would never be allowed to conceal its reports on fiscal matters or prohibit the public from commenting on budgets, yet in a matter of serious health and environmental risk, it considers this type of secrecy to be the norm.[227]

13.2 The Committee wishes to underline the importance of having an open and transparent process. Increasingly, the safety of pesticides is being called into question. In order to foster public confidence in the regulatory system, it is crucial that Canadians be fully informed about decisions affecting their health and their environment. They must also be given a meaningful opportunity to participate in the decision-making process. A first step towards achieving these goals is to provide the public with detailed information on pesticides.

The Disclosure of Information

13.3 One of the major concerns raised by witnesses was the lack of public information on pesticides. Many witnesses complained that information was simply not available, whether it be in relation to active ingredients, formulants or test data. Ironically, some pesticide information which is not released in Canada is making its way into this country through public disclosure in the US. The World Wildlife Fund, for example, indicated to the Committee that the information on the hazards posed by pesticides was protected as confidential business information in Canada. "This is especially silly," it added, "since the same data are freely available in the US."[228]

13.4 The problem in Canada stems from the fact there is no authority under the *Pest Control Products Act* to allow disclosure to the public of any information whatsoever. Because the Act is silent on this issue, the provisions of the *Access to Information Act* are applicable. This legislation, however, is quite restrictive. It requires that a request for information be made in writing to the appropriate authority (section 6). Public access is thus not contemplated as a matter of course; a written request must first be made. Even when the request is made, the applicant may not be given the sought-after information due to restrictions under the Act. The most important restrictions for the purposes of this discussion are set out in the exemption in section 20(1). This exemption requires a government institution, such as the PMRA, to refuse disclosure of any record that contains:

- trade secrets of a third party;
- financial, commercial, scientific or technical information that is confidential information supplied to a government institution by a third party and is treated consistently in a confidential manner by that party;
- information, the disclosure of which could reasonably be expected to result in material financial loss or gain to, or could reasonably be expected to prejudice the competitive position of a third party; or
- information, the disclosure of which could reasonably be expected to interfere with contractual or other negotiations of a third party.

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[227] Canadian Environmental Defence Fund, Brief to the Committee.

[228] World Wildlife Fund, Brief to the Committee.

13.5 It should be noted that the term "trade secrets" usually refers to the formula and the process used to produce a product such as a pesticide. Trade secrets, however, are frequently lumped in with other business information considered confidential by the person who owns the information, and, together, are generically termed "confidential business information."

13.6 By reason of the restrictions in section 20(1) of the *Access to Information Act*, the PMRA is thus unable to release "confidential business information." There is, however, a "public interest override" clause in section 20(6) that, in appropriate cases, could lead to the disclosure of the confidential business information otherwise protected under section 20(1). This override clause permits disclosure of information if the "disclosure would be in the public interest as it relates to public health, public safety or protection of the environment and, if the public interest in the disclosure clearly outweighs in importance any financial loss or gain to, prejudice to the competitive position of or interference with contractual or other negotiations of a third party."

13.7 A review of the jurisprudence on section 20(6) failed to disclose any cases where the public interest override had been invoked. It would therefore seem to be an under-utilized provision. It must be remembered, however, that the override clause is an exception to the general non-disclosure rule in section 20(1) and, as such, would have to be successfully invoked before the sought-after information could be released.

13.8 Given the restrictions under the *Access to Information Act*, the PMRA has indicated that its hands are tied in terms of disclosing confidential business information to the public. During her appearance before the Committee, however, Dr. Franklin stated that the PMRA was attempting to make information available for new active ingredients and major new uses regarding products being registered by obtaining the applicant's consent to disclosure. She also pointed out that public access to information would be improved under the forthcoming legislation.[229]

13.9 The Committee has reviewed the amendments recommended by the PMRA in its January 1999 document (see insert). We are particularly encouraged to see that information on pesticides, including confidential business information, would be made available to health care professionals and other government departments in specified circumstances. The Committee heard about the difficulties and frustrations experienced by some individuals in trying to obtain adequate information on pesticides in order to make a medical diagnosis or identify the cause of significant fish kills. It is high time that the paramount interests of those who are on the front lines in combating human illness and environmental harm be placed above the business interests of the pesticide manufacturers.

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[229] *Evidence*, Meeting No. 126, June 1, 1999.

Public Access to Information: the PMRA's Proposed Amendments

As regards major registration decisions made after the new Act was in force, the PMRA proposes that the new Act allow members of the public to inspect confidential information, including test data, but excluding confidential business information, provided they did not intend to use the information to register a product in Canada or elsewhere. Members of the public would also be allowed to obtain copies of evaluation reports, including the confidential information contained in them, but excluding confidential business information.

The definition of "confidential business information" would be set out in the regulations to allow modifications to be made as public policy evolved. It could comprise: manufacturing or quality control processes relating to pest control products; methods for determining the formulation of the product, including the identity or concentration of its components; and the identity or concentration of the product's components, other than active ingredients, unless disclosure was otherwise expressly required under the new Act or any other Act.

In addition, the new Act would allow the disclosure in confidence of information, including confidential business information, in specified circumstances. For example: to a physician for the purpose of making a medical diagnosis, to another government department to respond to a situation that endangers health or the environment, or to another regulatory authority with whom an agreement has been signed regarding the exchange of information about pest control products.

Persons privy to confidential information would be required to take appropriate measures to prevent its disclosure.

(Pest Management Regulatory Agency, *Proposed Amendments to the Pest Control Products Act*, January 1999, p. 17.)

13.10 While the proposed amendments would constitute an improvement over the status quo, they do not go nearly far enough. The Canadian Environmental Law Association and the Ontario College of Family Physicians, for example, recommended that the PMRA disclose all pest control product ingredients, as well as provide access to all information upon which registration and other regulatory decisions are based.[230] The Learning Disabilities Association of Canada pointed out that the PMRA does not publish in the Regulations its health data test requirements in relation to pesticides, thus making it difficult for the public to access a concise and readable list of such requirements.[231] This Association, as well as many other witnesses, was particularly concerned about the lack of information on toxic formulants. It recommended that the identity of toxic formulants should be excluded from the confidential business information designation and that the PMRA should require labelling for pesticides that contain hazardous ingredients, as is done in the US.[232]

13.11 Since 1987, it has been the policy of the US Environmental Protection Agency (EPA) to require special labelling for pesticides containing a "List 1" inert (an "inert" is the US equivalent of "formulant"). A "List 1" inert is an inert that is of toxicological concern based on carcinogenicity, adverse reproductive effects, neurotoxicity, other chronic effects, developmental toxicity, ecological effects and the potential for bioaccumulation. In the US, a pesticide containing a "List 1" inert must have on its label a statement that it contains a toxic inert, and the inert must be identified by name.[233]

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[230] Canadian Environmental Law Association and Ontario College of Family Physicians, Brief to the Committee.

[231] Correspondence to the Committee by the Learning Disabilities Association of Canada , March 2, 2000.

[232] Learning Disabilities Association of Canada, Brief to the Committee.

[233] United States Environmental Protection Agency, Web site, Office of Pesticide Programs, *Inert Ingredients in Pesticide Products: Policy Statement.*

13.12 The PMRA is now also requiring special labelling for toxic formulants. It informed the Committee that for new products containing toxic formulants on the EPA's Inerts List 1, the name of the List 1 formulant and the percentage at which it is present must be inscribed on the label, as must the following statement:

> This product contains x% of [common name of the formulant] which has been shown to be of toxicological concern.[234]

13.13 Active ingredients and formulants are not the only substances contained in pesticides that might be of concern because of their toxicity. Contaminants and micro-contaminants may also be of concern. The Committee learned, for example, that the PMRA granted a time-limited registration in relation to the pesticide "fenhexamid" on May 1, 1999 and that it was proposing to register the pesticide "hexaconazole." Both of these pesticides contain furans as microcontaminants. Furans have been designated as a Track 1 substance under the federal Toxic Substances Management Policy (discussed in Chapter 9).

13.14 The Committee is seriously concerned that pesticides containing any Track 1 substance, however minute the quantity, might be registered for use in Canada, and we have recommended in Chapter 9 that these products not be registered. On the other hand, we believe it essential that all toxic ingredients contained in a pesticide be identified on the product label, not unlike what is done in the US regarding the labelling of List 1 Inerts.

> **The Committee recommends that, as a condition of registration, the new Pest Control Act require that any pesticide containing a toxic formulant, contaminant or microcontaminant which is toxic within the meaning of section 64 of the *Canadian Environmental Protection Act, 1999*, bear a warning on its label that it contains a toxic ingredient, the amount and name of which must be identified on the label.**

13.15 Although the Committee favours the broadest possible policy regarding public access to information, we are aware that there are constraints that might place limits on disclosure. Article 1711.1 of the North American Free trade Agreement (NAFTA), for example, places restrictions on the disclosure of "trade secrets," while Article 1711.5 places restrictions on the disclosure of safety and effectiveness data submitted in support of an application to register an "agricultural chemical product" that utilizes new chemical entities. Article 39.3 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs), concluded under the World Trade Organization Agreement, contains a similar provision restricting the disclosure of safety and effectiveness data respecting agricultural chemical products. The Committee appreciates that the Canadian government must act within these confines. We note, however, that the US is also a party to these agreements and is therefore also bound by these restrictions, yet its disclosure policy is far more open than Canada's.

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[234] Correspondence to the Committee, Pest Management Regulatory Agency, January 24, 2000.

13.16 In the US, there is a general rule of non-disclosure in relation to information that has been clearly marked as a trade secret or commercial or financial information. However, there are exceptions to this rule, notably the requirement that the following information be made available for disclosure to the public:

- all information concerning the objectives, methodology, results or significance of any test or experiment performed on or with a registered or previously registered pesticide or its separate ingredients, impurities, or degradation products;

- any information concerning the effects of such pesticide on any organism or the behaviour of such pesticide in the environment, including, but not limited to, data on safety to fish and wildlife, humans and other mammals, plants, animals, and soil; and

- studies on persistence, translocation and fate in the environment, and metabolism.[235]

13.17 The Committee also notes the approach taken under the new *Canadian Environmental Protection Act, 1999* (CEPA). This Act essentially calls for the disclosure of selected information unless a claim of confidentiality is made and substantiated on specified grounds. Specifically, sections 46 to 53 of the new Act provide that, where information is requested by the Minister and the Minister indicates that it might be published, the respondent must request in writing that the information be treated with confidentiality. Confidentiality, however, may only be claimed on specified grounds, for example, where the information is a trade secret or its disclosure would likely adversely affect the respondent's financial or competitive position. If the Minister is satisfied that the respondent's claim is well-founded, he or she may accept the request. The Minister, however, has an overriding discretion to reject a well-founded claim where disclosure is in the interest of protecting the environment or public health or safety and where the public interest in the disclosure outweighs any adverse affects to the respondent's financial or competitive position.

13.18 Except for the fact that these provisions apply only to information that the Minister indicates might be published, the Committee sees merit in the approach taken. It requires that the submitter first flag the information for which confidentiality is claimed. It then provides for such claims to be sustained only if the information meets the prescribed criteria for confidentiality, subject to an overriding discretion to disclose the information where the public interest outweighs that of the claimant.

13.19 This approach, in the Committee's opinion, would work well with respect to the pesticides information held by the PMRA. It is important, however, that the criteria for confidentiality be narrowly defined. We also believe that, like the US legislation, there should be a non-exhaustive list of the information that could not be withheld on grounds of confidentiality.

[235] *United States Code*, Title 7, Chapter 6 , section 136h(d).

The Committee recommends that the new Pest Control Act contain measures which would allow the broadest possible disclosure of information to the public. At a minimum, these measures should be similar to the disclosure provisions set out in sections 51 to 53 of the *Canadian Environmental Protection Act, 1999*, and should be supplemented by a non-exhaustive list of information that would have to be disclosed publicly. In particular:

(a) the new Pest Control Act should provide for the public disclosure of all information provided to the Pest Management Regulatory Agency in relation to pesticides;

(b) a request for confidentiality may be made in writing but it should be sustained only in relation to confidential business information, subject to an overriding discretion to disclose confidential business information where the public interest outweighs the financial or competitive interests of the person requesting confidentiality;

(c) the term "confidential business information" should be defined narrowly to encompass only information that would be truly prejudicial to the financial or competitive interests of the person to whom it belongs; and

(d) a non-exhaustive list should be provided of information that would have to be disclosed to the public, even though the information might otherwise qualify as confidential business information. Without limiting the generality of the foregoing, such a list should specifically include:

- **information respecting the ingredients of pesticides, including formulants, contaminants and by-products;**
- **all information concerning the objectives, methodology, results or significance of any test or experiment performed on or with a registered or previously registered pesticide or its separate ingredients, impurities, or degradation products;**

(1) any information concerning the effects of such pesticide on any organism,

(2) the behaviour of such pesticide in the environment, and

(3) including, but not limited data on safety to humans, animals, plants and soil;

- **studies on persistence, translocation and fate in the environment, and metabolism.**

An Electronic Public Registry of Information

13.20 Given the importance of ensuring public access to information, the Committee believes it is essential that an electronic public registry containing a broad range of pesticide related information be created under the new Act.

13.21 The PMRA recommended in its January 1999 document[236] that the new Act require the establishment of a register, that would include the following information:

- conditions of registration and validity period for all registered products;
- reports of evaluations of risks and value;
- test data provided by applicants and registrants to support registration applications, re-evaluations, specials reviews, and maximum residue limits; and
- advisory council reports.

13.22 The PMRA also recommended that the new Act contain regulatory authority to allow the inclusion in the Register of additional information, such as:

- the registration status of all registered and formerly registered products;
- maximum residue limits;
- basic information about applications, date of receipt and projected decision date;
- additional information considered in making registration decisions;
- consultation documents (PRDDs) and decisions documents;
- notices and reports of additional studies;
- reports and findings regarding adverse effects;
- requests for special reviews, with related decision and reasons;
- notices regarding re-evaluations, special reviews, consultations, and export permits;
- notices of objection and the Minister's decision and reasons;
- information submitted to review panels regarding the product in question, review panel reports and subsequent decisions; and
- export, research, own-use import and other permits.

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[236] Pest Management Regulatory Agency, *Proposed Amendments to the Pest Control Products Act*, January 1999, p. 16.

13.23 The PMRA indicated, however, that only some of the information in the register would be publicly available, namely the information it proposed should be disclosed to the public. As mentioned in the previous section entitled "Disclosure of Information," this information would comprise "confidential information" (which the PMRA did not define), including test data and evaluation reports, but excluding "confidential business information" (which was also not defined). It further specified that the public would be allowed to "inspect" this information, suggesting something less than electronic access.

13.24 In the Committee's opinion, the PMRA's proposal is too limited. Subject to the narrow exception for confidential business information that we recommended be enacted in the previous section and subject to any restrictions regarding access to information imposed under the international agreements to which Canada is a party (e.g. NAFTA and the WTO), the public should have access to all relevant information, and such information should be accessible through an electronic registry. Information should be made available not only in relation to the pesticide approval process, but also in relation to enforcement action taken under the Act and other activities undertaken by the PMRA.

The Committee recommends that the new Pest Control Act require the establishment of an electronic public registry.

The Committee, subject to the narrow exemption recommended in this report for confidential business information and such restrictions on access to information as are imposed under binding international agreements, recommends that the registry contain as much information as possible, including:

- **the registration, special review and re-evaluation of pest control product documents, including related test data, conditions of registration, validity period for all registered products, reports of evaluations of risks and value, and maximum residue limits;**
- **the cancellation or suspension of registration certificates;**
- **notices of objection and related disposition of the cases;**
- **export, research, own-use import and other permits;**
- **enforcement action and related disposition of the cases;**
- **the adverse effects database, the alternatives to pesticides database and the pesticide sales and use database;**
- **advisory body reports;**
- **interdepartmental memoranda of understanding;**
- **international harmonization activities; and**
- **proposed and final texts of regulations, policies, guidelines and codes of practice.**

Annual Report to Parliament

13.25 There is currently no obligation on the PMRA or the Minister of Health to prepare and table before Parliament an annual report on the administration and enforcement of the *Pest Control Products Act*. In the Committee's opinion, it would be desirable to have such a document to complement the more detailed information that would be available on the electronic public registry.

13.26 An annual report would provide members of the public, as well as Parliamentarians, with a useful digest of the activities carried out under the new Act. Not everyone will have the time or the tools at hand to consult the electronic public registry on a regular basis. It is thus important to make available an alternative, condensed source of information. An annual report would also provide a permanent "fixed-in-time" record of the PMRA and Minister's actions, which would allow for comparison to be made from one year to the next, as well as for assessment of administrative successes, weaknesses and failures.

13.27 The Committee notes that annual reports are required in relation to many statutes. The Minister of the Environment, for example, must prepare and table in Parliament an annual report in relation to the *Canadian Environmental Protection Act, 1999*. The Minister of Health is also required to do so in relation to the *Canada Health Act*. Given the serious concern surrounding the use of pesticides in this country, including the current process for approving their use, the Committee believes it is essential that an annual report be prepared to inform Parliamentarians and the public at large on new developments under the Act.

The Committee recommends that the Minister of Health be required to table in Parliament an annual report on the administration and enforcement of the new Pest Control Act.

Participation in the Decision-Making Process

13.28 Keeping Canadians informed about the decisions that affect them is an essential first step in fostering public confidence in the regulatory system. A vital second step is to ensure that the public has a meaningful opportunity to participate in the decision-making process.

13.29 The current Act is silent on the role of the public in the registration process. The regulations, in turn, allow for appeal, but only where the Minister refuses to register or amend a certificate of registration or where the Minister cancels or suspends the registration (section 22 of the current Pest Control Products Regulations). There is, however, no appeals process for decisions to register a pesticide, or to renew or maintain a certificate of registration. There are also no requirements for public consultation under the current Act or Regulations. Thus, to the extent that public consultations have taken place, these have been carried out on a voluntary rather than mandatory basis.

13.30 The PMRA proposes opening up the process somewhat. It recommends that before a final registration decision is made, the public be consulted on new active ingredients, changes that might result in significantly increased risk, re-evaluations and special reviews. The PMRA also recommends that the procedures for carrying out the consultations be specified in the regulations, which could include the following measures: notification to the public that a final major decision was pending, publication of the Proposed Regulatory Decision Document (PRDD), an opportunity for public comment on proposed decisions, provisions regarding the contents of the PRDDs, timelines for consultation, consideration of any comments made prior to making a final decision, publication of a decision statement including the final decision, the reasons for the decision and a summary of the comments received, and exemptions from the provisions regarding public consultation. The PMRA also proposes to give members of the public the opportunity to challenge a decision by filing a notice of objection and requesting the establishment of a review panel.[237]

13.31 The Committee supports the proposed amendments in principle. These recommended changes would constitute a marked improvement over what is prescribed at present which, as previously indicated, is next to nothing. In our opinion, however, it is essential that these measures be set out in the new Act rather than the Regulations. Provisions regarding the right of Canadians to receive notice, to comment on and to appeal decisions that might materially affect them are too fundamental to be relegated to the regulations, where they might be readily changed at the discretion of the Governor in Council. Given the importance of having an open and transparent process, it is imperative that such measures be enshrined in the legislation following consideration and approval by Parliament. The Committee also believes that the notice and comment provisions should be extended to all pesticide registrations, and not just to those involving new active ingredients. In addition, the public should be given the opportunity to comment on all proposed regulations, policies, memoranda of understanding, agreements, guidelines and codes of practice. They should also be entitled to receive some feedback on how their comments were taken into consideration. This requirement would be distinct from, and in addition to, the obligation for the PMRA to establish a direct feedback mechanism regarding the submission of scientific research, which we recommended be established in Chapter 8.

The Committee recommends that:

(a) the new Pest Control Act require that notice be given in relation to all proposed registration decisions, special reviews, re-evaluations, major registration changes, regulations, policies, memoranda of understanding, agreements, guidelines and codes of practice and that the public be afforded a reasonable opportunity to comment;

(b) the new Pest Control Act require that the comments received be considered before a decision is taken and that a summary outlining how the comments were taken into consideration be provided with the decision;

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[237] Pest Management Regulatory Agency, *Proposed Amendments to the Pest Control Products Act*, January 1999, p. 18-20.

(c) the new Pest Control Act allow any party to file a notice of objection concerning major decisions taken under the Pest Control Act, including decisions respecting registrations, re-evaluations, special reviews and certificate amendments and the Minister be given the authority to determine whether or not a review panel should be established based on criteria set out in the legislation.

Pesticide Sales and Use Inventories

13.32 In his 1999 report, the Commissioner of the Environment and Sustainable Development was highly critical of the PMRA's failure to establish a national database respecting pesticide sales. He noted that of the 22 countries responding to an OECD survey, only Canada and the Slovak Republic did not collect such data. The Commissioner expressed concern that, without such data, Canada had no ability to measure amounts of pesticides used and released into the environment. This information, he added, was needed to monitor risks to health, safety and the environment and to measure the extent to which lower-risk pesticides and non-pesticide alternatives were being adopted.[238]

13.33 Many witnesses shared the concern of the Commissioner. Some progress, however, is being made. During her appearance on June 1, 1999, Dr. Franklin of the PMRA indicated that a national database on pesticide sales should be fully operational by the end of 2000. She expected that 2001 would be the first year for the comprehensive collection of national pesticide sales data.[239]

13.34 The Committee supports this initiative; it is long overdue. We note with interest that the authority for such a database has been in existence for some time: section 26 of the current Pest Control Products Regulations requires registrants to make and keep for up to three years a record of all quantities of pesticides stored, manufactured or sold by them. They are also required, upon request, to make such data available, albeit to the Director General of the Plant Industry Directorate within Agriculture and Agri-Food Canada. Given the reference to this official, it is obvious that the Regulations were not updated when the PMRA took over in 1995. We were informed by an official with Environment Canada that his Department along with Agriculture and Agri-Food Canada used to track sales prior to 1995, but with the creation of the PMRA, the responsibility was moved to that agency.[240]

13.35 The Committee is very concerned that this program was dropped when the PMRA was formed. It is time that it be reactivated. We would enhance the current regulation, however, by requiring that sales data not only be kept and supplied on request, but that the collection and transmittal of the data to the PMRA on an ongoing basis be made a specific condition of registration.

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[238] Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, 1999.
[239] *Evidence*, Meeting No. 126, June 1, 1999.
[240] *Evidence*, Meeting No. 127, June 2, 1999.

The Committee recommends that:

(a) as a condition of product registration, the new Pest Control Act require registrants to provide the Pest Management Regulatory Agency with their sales data on an ongoing basis which, at a minimum, must identify the product and amount sold, as well as the location and date of sale; and

(b) the pesticide sales inventory be made public on the electronic public registry of information.

13.36 Like the Crop Protection Institute, however, the Committee questions the utility of having a database on pesticide sales only. As the Institute pointed out, a correlation between sales and use cannot readily be made:

> We question the utility of manufacturer's sales data as an indicator of use or risk simply because aggregate sales do not indicate immediate or even near-term use. Inventory levels through our dealers vary from 20% to 50% from one year to another. Additionally, sales are made to national or regional distributors whose end customers may be quite removed from the original sales region. Practically, the only real indicator of pesticide use is at the farm level.[241]

13.37 It should be noted that data on pesticide use is being collected on a more local level. The World Wildlife Fund indicated, for example, that the province of Ontario conducts surveys about every five years on agricultural pesticide usage, which provide detailed data on a county-by-county and crop-by-crop basis. The province of Quebec carries out surveys on certain crops, including corn-soybean rotation. Prince Edward Island also does some data collection, while Alberta does a survey of pesticide distributors to try to assess volume. As the World Wildlife Fund points out, it is "a bit of a hodgepodge" in Canada. The system in California, by contrast, is very extensive and requires reporting from users, distributors and manufacturers.[242]

13.38 The Committee understands that the pesticide use reporting system in California is among the most comprehensive in the world. Inaugurated in the 1950's and expanded over the decades, this system currently imposes reporting requirements on agricultural pest control operators and "commercial pest control operators" (i.e. those engaged in the business of pest control for hire, such as ground and aerial applicators, structural operators and professional gardeners). The reporting requirements also apply in relation to all "agricultural uses," a term broadly defined to include pesticide applications to parks, golf courses, cemeteries, rangeland, pastures, and along roadside and railroad rights-of-way. All post-harvest pesticide treatments of agricultural commodities must also be reported, as must all pesticide treatments in poultry and fish production as well as livestock applications. The primary exceptions to the full use reporting requirements are home and garden use, and most industrial and institutional uses.[243]

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[241] Crop Protection Institute, Brief to the Committee.

[242] *Evidence*, Meeting No. 129, June 10, 1999.

[243] California Environmental Protection Agency, Web site, Pesticide Use Reporting, An Overview of California's Unique Full Reporting System, January 2000.

13.39 There is little doubt that collecting data on pesticide use, as opposed to pesticide sales, would be advantageous. Information on use would best enable the PMRA and other government agencies to determine the extent of pesticide use, as well as the rate of compliance with the directions for use. Such information would also be useful in determining whether risk reduction and integrated pest management strategies are working. Most importantly, data on usage would be instrumental in regarding connections between exposure and harm to human health and the environment. A number of witnesses called for the creation of a database on pesticide use. The Canadian Environmental Law Association and the Ontario College of Family Physicians for example, were of this opinion. They stated:

> The PMRA should promptly establish an enforced pesticide sales and use reporting requirement and a pesticide database. The database should be organized by active ingredient and should include detailed information regarding the quantities and locations of pesticide sales and use. Particular emphasis should be placed on reporting information relevant to assessing the effects of pesticide use on children. This information should inform pesticide regulatory decision-making.[244]

13.40 The Committee notes that Environment Canada has been collecting data on the release of selected pollutants since 1993 under a program called the National Pollutant Release Inventory (NPRI). This program, which is mandatory under section 48 of the new *Canadian Environmental Protection Act, 1999*, is geared primarily toward tracking industrial pollutants. It does not generally track pesticides. In fact, it expressly excludes from its ambit the growing, harvesting and renewable resources management (forestry, fisheries and agriculture) sectors.

13.41 In the opinion of the Committee, there is as much justification and urgency for the creation of a country-wide database on pesticide use as there was for creating a national database on industrial pollutants in 1993. We recognize, however, that setting up a comprehensive database on pesticide use, collecting the related data, and ensuring compliance would represent a massive *and* costly undertaking. While we would vastly prefer to recommend the creation of a broad-based use inventory similar to the California model, we feel compelled at this time to propose a more modest system. It would constitute an important beginning, however, and the system could be expanded over the years, though hopefully not the forty years it took California to put in place the comprehensive system it is noted for today.

13.42 Drawing from the NPRI model, the Committee proposes the creation of a pesticide use inventory that would begin by targeting the pesticides of greatest concern, be it because of their suspected effects on vulnerable populations, the prevalence of their use across the country or their proven or suspected toxic effects in general. As is done in relation to the NPRI, the selection of the pesticides covered under the database should be selected by an advisory body. In our opinion the Pest Management Advisory Council, set up in 1998 to advise the Minister of Health on pest management issues, would be well suited to this task given its broad-based membership with representatives from the health, environmental, consumer, academic, horticultural, agricultural and pesticide-manufacturing sectors.

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[244] Canadian Environmental Law Association and Ontario College of Family Physicians, Brief to the Committee.

The Committee recommends that:

(a) the new Pest Control Act require the establishment of a national pesticide use inventory to track the use of designated pesticides, beginning with the pesticides of greatest concern;

(b) the Pest Management Advisory Council be charged with the selection of the pesticides subject to mandatory reporting under this inventory; and

(c) the pesticide use inventory be made public on the electronic public registry of information.

Whistleblower Protection

13.43 The Commissioner of the Environment and Sustainable Development observed that the PMRA has only a limited enforcement staff to verify compliance with the Act and Regulations. The Agency has the equivalent of 44 officers to inspect farms, food processing plants, commercial application facilities, retail outlets, pesticide registrants and formulators, lawn care companies and so on throughout Canada.[245]

13.44 Given the PMRA's scarce resources and the magnitude of the task at hand, it is important to involve the community in ensuring that the law is observed. Members of the public and workers are well placed to provide assistance, but they must not be placed at risk for coming forward. Meaningful whistleblower protection must be extended to them.

13.45 The new *Canadian Environmental Protection Act 1999* (CEPA 1999) extends such protection. Section 16, for example, encourages members of the public to make voluntary reports by protecting their identity if they request anonymity.[246] Specifically, it is an offence under section 16(3) of the new CEPA for anyone to disclose or cause to be disclosed the whistleblower's identity, or any information that could reasonably be expected to reveal his or her identity, where anonymity has been requested unless the whistleblower expressly authorizes the disclosure in writing. Workers may also claim anonymity, but they are given added protection under section 16(4); their employer is prohibited from dismissing, suspending, demoting, disciplining, harassing or otherwise disadvantaging them should they blow the whistle or refuse to do anything that would be an offence under the Act. This workplace protection extends to all employees in Canada and not only those who fall under federal jurisdiction.

13.46 In the opinion of the Committee, similar whistleblower protection should be afforded to Canadians under the new Act. We believe, however, that the protection against reprisal should be extended to all whistleblowers and not just employees. Technically, whistleblowers may not always be "employees." For example, they may be employed by another firm that is doing business with the alleged offender, or they may be self-employed persons working for the alleged offender under a

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[245] Report of the Commissioner of the Environment and Sustainable Development, Chapter 4, 1999.

[246] Whistleblower protection is also provided under sections 96, 202 and 213 of the new *Canadian Environmental Protection Act, 1999*.

contract of service. Because these persons might not qualify as "employees," they might be at risk of reprisal. For example a contract, which would otherwise have been renewed, might not be renewed because of the whistleblowing, or the whistleblower may not be considered for future contracts. As "non-employees," however, these persons would be unable to invoke the Act's protection against retaliatory action.

13.47 The objective of whistleblower protection is to encourage people to make voluntary reports of offences that have been committed or that are about to be committed. In meeting this objective, it is important that as broad a safety net as possible be cast. In the Committee's opinion, the protection afforded against reprisal should not turn on the whistleblower's employment status. Rather, it should turn on whether or not the whistleblower has been, or is at risk of being, disadvantaged because of the disclosure. Obviously, if the protection afforded under the legislation were strictly related to the workplace, such as requiring the reinstatement of a dismissed employee, the Committee could not recommend extending protection to non-workplace environments. Under the CEPA model, however, the protection afforded is prohibitory in nature; it is an offence for an employer to take retaliatory action against a whistleblowing employee. Given the nature of the protection, the Committee believes that it would be appropriate to extend this type of prohibition to the non- employment context as well.

The Committee recommends:

(a) that whistleblower protection be provided under the new Pest Control Act. In particular, the new Pest Control Act should make it an offence for anyone to disclose the identity of any person, including an employee, who voluntarily reports an offence that has been committed or that is likely to be committed under the new Pest Control Act unless that person waives anonymity;

(b) that it be an offence under the new Pest Control Act for anyone to take any kind of retaliatory action against, or to otherwise disadvantage, any person who, acting in good faith and on the basis of reasonable belief, voluntarily reports an offence that has been committed or that is likely to be committed under the new Pest Control Act, or refuses or expresses an intention to refuse to do anything that would constitute an offence under the new Pest Control Act; and

(c) that it be an offence under the new Pest Control Act for an employer to dismiss, suspend, demote, discipline, harass, impede in advancement, or otherwise disadvantage an employee who, acting in good faith and on the basis of reasonable belief, voluntarily reports an offence that has been committed or that is likely to be committed under the new Pest Control Act, or refuses or expresses an intention to refuse to do anything that would constitute an offence under the new Pest Control Act.

John Sankey

14. THE SPECIAL INFORMATION NEEDS OF WORKERS AND HEALTH CARE PROFESSIONALS

The Workers' Right to Know

14.1 The need for Canadians to be fully informed about the pesticides used in their communities is especially important in the case of workers who may be continuously exposed to potentially harmful substances in the workplace.

14.2 In order to inform workers about the hazardous materials used in their workplace a national system, the Workplace Hazardous Materials Information System (WHMIS), was instituted in 1988. The key elements of this program are cautionary labelling of containers of hazardous materials, provision of Material Safety Data Sheets (MSDSs) and worker education programs. At the federal level, the *Hazardous Products Act* was amended to require the suppliers of controlled products to provide adequate labels and MSDSs as conditions of sale and importation. Complementary federal, provincial and territorial occupational safety and health legislation was also modified to require employers to label hazardous materials in the workplace, make MSDSs available to workers and implement worker education programs.

14.3 Unfortunately, pest control products were excluded from the WHMIS at the time the program was set up. Their exclusion, which was maintained following a parliamentary review in the early 1990s, continues to this day. The Committee is not satisfied that the exclusion should be retained. A recapitulation of events may, in part, explain our position.

14.4 The federal WHMIS legislation came into force in October 1988. Among other things, it called for a parliamentary committee to conduct a review of the products excluded from the WHMIS program two years after the proclamation date of the legislation. In anticipation of this review, the (then) Minister of Consumer and Corporate Affairs launched an administrative review in January 1990, in consultation with industry, labour, provincial/territorial governments and relevant federal departments. Five sectoral committees were created under this initiative to review the exclusions, including the Pest Control Products Sectoral Committee.

14.5 The Pest Control Products Sectoral Committee was chaired by Agriculture Canada. It initiated a tripartite consultation process involving pesticide manufacturers, labour and provincial occupational safety and health officials; its specific terms of reference were to:

- consider the need for "WHMIS-type" information in relation to pest control products;
- harmonize the requirements under the *Hazardous Products Act* and the *Pest Control Products Act*, keeping the safety of workers as a paramount principle; and
- prepare a report outlining how the two systems could be harmonized.

14.6 Based on a consensus of the parties, the Pest Control Products Sectoral Committee recommended in its report that "WHMIS-type" measures be implemented in relation to pest control products, including the provision to workers of MSDSs that met the WHMIS standards, and the requirement that suppliers of pesticides disclose ingredients (formulants) according to WHMIS standards.

14.7 An amalgamated report of the five sectoral committees was tabled in Parliament on April 10, 1991, and was subsequently referred for study to the Standing Committee on Consumer and Corporate Affairs and Government Operations. This Committee tabled its report in the House of Commons on April 27, 1992. Noting that consensus of the parties had been an integral component of the WHMIS at the time of its creation, the Committee expressed the view that it would be not only impractical but also contrary to the philosophy of the WHMIS to undo any agreement that had been reached by the participants in the review process. Without questioning the consensus recommendations of the Pest Control Products Sectoral Committee, the House Committee simply recommended that the federal government accept and implement them.

14.8 The Committee wishes to stress that the issue of whether to retain the WHMIS exclusion for pesticides appears not to have been specifically considered given the terms of reference of the Pest Control Products Sectoral Committee. Rather, the Pest Control Products Sectoral Committee studied whether parallel measures outside of the WHMIS could be implemented.

14.9 Pesticides continue to be excluded from the WHMIS, but some voluntary steps have been taken. The Crop Protection Institute, for example, pointed out to this Committee that under the Warehousing Standards program set up in 1995, all pesticide warehouses have to be certified by the

Agrichemical Warehousing Standards Association (AWSA)[247] in order to do business with the Institute's member companies. In addition, as part of the certification requirements, MSDSs have to be made available. The Institute also indicated that industry is developing an electronic database for MSDSs, to be made available to growers through retailers in both electronic and hard copy format. Participation in this database will be required under the AWSA warehousing requirements. The Institute also noted that all member companies are required to submit MSDSs with their submissions to the PMRA. If they fail to do so, the submission package would be rejected.[248]

14.10 While the Committee supports these initiatives, we are concerned that workers handling or exposed to pesticides are not given the same comprehensive legal protection afforded the workers who are covered by the WHMIS. This point was made forcefully by the Canadian Labour Congress:

> [If] you look at some very, very strict rules about what manufacturers must disclose and what they may conceal, you see that there's an enormous discrepancy between the way the industrial chemicals are treated and the way that pesticides are treated. They're all chemicals. Many of them are toxic. They're all potential pollutants, and yet, there is a huge discrepancy between the way the pesticides are treated and the way that industrial chemicals are treated.[249]

14.11 During its appearance on November 23, 1999, the Canadian Labour Congress (CLC) provided the Committee with a copy of a report entitled *The Right to Know About Chemical Pesticides: A Discussion Paper*, which was prepared for the CLC in December 1998 by Katherine Davies of Ecosystems Consulting Inc.. Ms. Davies noted in her report that the 1992 recommendations of the Standing Committee on Consumer and Corporate Affairs and Government Operations to harmonize the workers' right to know requirements for pesticides with the WHMIS standards had not been implemented. Having examined the MSDSs developed in relation to pesticides, she concluded that few, if any, of these met the requirements for MSDSs under the WHMIS. She also compared other WHMIS requirements such as classification of hazards, confidentiality of information, labelling requirements, training and education, with the measures adopted in relation to pesticides and she came to a similar conclusion. Ms. Davies stated in her report:

> There is only a very limited worker and public right to know about pesticides in Canada because WHMIS does not apply to pesticides and the PCPA [the *Pest Control Products Act*] contains different and mostly weaker requirements for classification, labels and hazard symbols. Furthermore, the PCPA (as well as the relevant provincial legislation/regulations) does not contain any requirements for the preparation of MSDSs. In addition, the PCPA's failure to address confidentiality has resulted in an unwritten policy of blanket secrecy regarding pesticide identity(ties) and hazard information, this is clearly a very inequitable situation. Workers and the public should have the same rights to know about pesticides as they have for other types of hazardous materials. This situation is not conducive to occupational health and safety or public health and safety.[250]

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[247] The Agrichemical Warehousing Standards Association (AWSA) was established to succeed the Warehousing Committee of the Crop Protection Institute of Canada in activities related to warehousing standards. Its bylaws permit a Supervisory Board of not more than 13 persons representing certificate holders, manufacturers, distributors, public warehouses and government; AWSA Web site, January 2000.

[248] Crop Protection Institute, Brief to the Committee; *Evidence*, Meeting No. 9, November 25, 1999.

[249] *Evidence*, Meeting No. 7, November 23, 1999.

[250] K. Davies, *The Right to Know About Pesticides: A Discussion Paper*, prepared for the Canadian Labour Congress, December 1998, p. 24.

14.12 Based on her analysis, Ms. Davies recommended that pesticides be brought within the WHMIS framework and that they be required to meet all the WHMIS requirements, recognizing that some modifications will be needed to labels and MSDSs to account for the differences between pesticides and other types of hazardous substances.

14.13 The Committee sees value in voluntary initiatives. In our opinion, however, they must supplement and not replace legislated standards. Ensuring the safety of workers through legislated standards which can be enforced is of paramount importance. The Committee finds it unacceptable that pesticides are not dealt with as strictly as other chemicals used in the workplace. In our opinion, they should be placed on an equal footing and brought within the WHMIS framework.

The Committee recommends that the current exemption of pesticides from the Workplace Hazardous Material Information System (WHMIS) be removed and that pesticides be required to meet all the WHMIS requirements, subject to such modifications as are needed to account for the differences between pesticides and other types of hazardous substances.

Health Care Professionals

14.14 Workers who may be continuously exposed to pesticides are not the only ones to have special information needs in relation to pesticide products. Health care professionals must also have access to detailed information above and beyond what is available to the general public.

14.15 It is evident to the Committee that the kind of in-depth and readily accessible information needed by medical practitioners to properly diagnose and treat cases of pesticide poisoning is lacking. The PMRA has a toll-free number, but this number is little known and, based on the evidence presented, is not particularly "user-friendly." This point was made to the Committee by Peggy Land of the Campaign for Pesticide Reduction, who stated that, the toll-free number "is not even in the phone book and it's certainly not widely advertised. If you do call, you have to know exactly what to ask for."[251] Ms. Land also described the run-around she was given when she attempted to obtain information on the pesticide "Par 3" on behalf of a physician who had contacted her organization:

> I didn't have a file on Par 3, so I called Weed Man and various other companies and was given not only contradictory information but utterly useless information. One girl told me she had to look it up and said it was the name of the lawn care product. I asked her what it was exactly, and she told me it was the name of it, like baking soda is baking soda.[252]

14.16 The Urban Pest Management Council of Canada spoke encouragingly of the toll-free number that is printed on the label of the great majority of domestic products. This organization stated that if there are any concerns about the environment, health or whatever, the companies welcome the calls on their twenty-four hour help line service and they track such calls.[253] The Committee's own investigation, however, was not as encouraging. A member's legislative assistant purchased two products. One product was a fungicide, for which there was no toll-free number. The other product

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[251] *Evidence*, Meeting No. 3, November 4, 1999.

[252] Ibid.

[253] *Evidence*, Meeting No. 8, November 24, 1999.

had a toll-free number, but when the call was placed, the assistant was told to talk to someone during business hours.

14.17 Dr. Kelly Martin, a staff emergency room physician and also a member of the Board of Directors of the Canadian Association of Physicians for the Environment, was quite categorical in stating that in terms of the kind of information needed by medical practitioners there was nothing or next to nothing available, whether it be the web sites, the hot-line numbers or the Health Protection Branch within Health Canada. She stated in reference to two of her emergency cases:

> The person went to the company that had sprayed their neighbours' property and brought in the product. There was very little information. There was the 1-800 number or you could go on the web and get it — which we did through the hospital. It told you to wash your hands, and if the child drank it you should make them vomit — very basic things. This was not medical information. It didn't give you the probability of them going into seizures or cardiac toxicity.
>
> One child had a lot of difficulty breathing, had to have help breathing, and had seizures. What do you do? What sort of interventions do you do? There's nothing available on that. From the Children's Hospital we made very valid attempts through mother-child risk in Toronto, poison control, and the numbers and websites. We thought maybe we could find something from pesticide websites from the government, but there wasn't anything.[254]

14.18 Dr. Martin also told the Committee that some physicians are so poorly informed about pesticide poisoning that they don't even know enough to run a blood analysis to detect the pesticide's presence in the body.[255]

14.19 The Committee is very concerned by this evidence. In our opinion, it is essential that health care professionals have access to detailed toxicological information to be able to detect and treat cases of pesticide poisoning. As was mentioned in Chapter 13 (the disclosure of information), some help appears to be on the horizon; the PMRA recommended that the new Act permit the disclosure of confidential business information to physicians for the purpose of making a medical diagnosis subject to their maintaining the confidentiality of the information.[256] If pesticides are brought under the Workplace Hazardous Material Information System (WHMIS) as we recommend in the previous section (The Workers' Right to Know), medical personnel will also have access to otherwise privileged confidential business information for emergency purposes.

14.20 While these initiatives should improve the situation, it is questionable whether the information will be accessible when needed. Medical personnel require not only access to information, but "timely" access to information. To this end, the Committee believes that the Minister of Health acting alone or with his provincial and territorial counterparts, should set up a twenty-four hour medical emergency information service on pesticides. This could involve the creation of a

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[254] *Evidence*, Meeting No. 11, December 1,1999.

[255] Ibid.

[256] Pest Management Regulatory Agency, *Proposed Amendments to the Pest Control Products Act*, January 1999.

dedicated toll-free number or a dedicated website, such as the Canadian Health Network. Alternatively, it could involve the designation of selected hospitals across the country as "poison information centres." The Committee did not receive any evidence on this issue and is, therefore, not in a position to make a specific recommendation on the means that should be employed. It is important, however, that a medical emergency information system be set up. Since cases of acute distress could involve toxic substances other than pesticides, we recommend that such a service cover all toxic substances and not just pesticides.

The Committee recommends that the Minister of Health, solely or jointly with the provincial and territorial Ministers of Health, establish an effective twenty-four hour medical emergency information service with respect to pesticides and other toxic substances.

14.21 There would be little point in providing a medical emergency information service on pesticides and other toxic substances if health care professionals were not concomitantly educated about the service's existence or, more generally, about the known or potential risks and adverse effects associated with the use of these substances. It is important that the medical profession receive the requisite training, both in medical school and through professional development programs. It is also important that they be encouraged to report cases of adverse effects to the PMRA for inclusion in the adverse effects database that the Committee recommends be created in Chapter 9. Their reporting such cases will not only add to the existing pool of knowledge, it might also play a pivotal role in having the product re-evaluated under the special review provisions, discussed in Chapter 10. Since the provinces and territories have primary responsibility in these areas, the Minister of Health should work closely with his provincial and territorial counterparts to ensure the achievement of these goals. Professional medical bodies, as well as the national/provincial/territorial medical associations, could also play a pivotal role by providing their members with up-to-date information on disease related to pesticides and other toxic substances and by encouraging members to report adverse effects, The Minister of Health should, therefore, enlist their active participation.

The Committee recommends that the Minister of Health, in partnership with the provincial/territorial Ministers of Health, the governing bodies for medical practitioners and the national/provincial/territorial medical associations:

(a) ensure that health care professionals are given the necessary education and training to identify and treat illnesses caused by, or involving exposure to, pesticides and other toxic substances; and

(b) encourage health care professionals to report cases of adverse effects to the Pest Management Regulatory Agency for inclusion in the adverse effects database recommended by the Committee.

PART F:

THE PEST MANAGEMENT REGULATORY AGENCY

15. INSTITUTIONAL CHANGES

15.1 In its 1990 report (the Blue Book), the Pesticide Registration Review Team recommended that the PMRA be created under the revised legislation as a self-contained, arms-length agency that would report directly to the Minister of Health.[257] While the federal government agreed to create the PMRA, it rejected the recommendation that it be an arms-length agency. Asserting the need to ensure ministerial accountability, the government indicated that the PMRA would be established within the Department of Health, but that the characteristics of the Agency would be largely the same as those of an arms-length agency.[258]

15.2 Acting on this promise, the federal government created the PMRA within Health Canada in April 1995. Akin to a branch within the Department, the Agency reports directly to the Deputy Minister of Health and, through this official, to the Minister of Health.

15.3 Witnesses did not question the PMRA's lack of independent status. In the circumstances, the Committee does not propose to pursue the matter. The Committee firmly maintains, however, that

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[257] Pesticide Registration Review Team, *Recommendations for a Revised Federal Pest Management Regulatory System*, Final Report, December 1990.

[258] *Government Proposal for the Pest Management Regulatory System*, October 1994.

regardless of whether it is an independent agency or simply a part of Health Canada, the PMRA must be given a statutory base.

A Statutory Base for the PMRA

15.4 The PMRA comes under the authority of the Minister of Health, but there is little question that the Agency is the real decision-maker with respect to daily operations. In the Committee's opinion it is important that this reality be reflected in the legislation. The fact that the PMRA is part of Health Canada, rather than a separate entity, should not be a barrier to providing the Agency with a statutory base. There are precedents from which to draw. One example is the Patent Office.

15.5 The Patent Office was set up within Industry Canada under the authority of section 3 of the *Patent Act*. Section 4(1) of this Act calls for the appointment of a Commissioner of Patents "who shall, under the direction of the Minister, exercise the powers and perform the duties conferred and imposed on that officer by or pursuant to this Act," whereas section 4(2) sets out the duties of the Commissioner, including the receipt of applications for patents and the issuance of patents.

15.6 There are considerable similarities between the Patent Office and the PMRA. The Patent Office is responsible for assessing patent applications and granting patents in appropriate cases. The PMRA is responsible for assessing pesticide applications and granting certificates of registration in appropriate cases. Both agencies are subject to the overall authority and direction of the Minister. The Patent Office, however, has a statutory base but the PMRA does not.

15.7 Providing the PMRA with a statutory base is not among the amendments the Agency recommended in its January 1999 document. This oversight should be corrected. As the government indicated in the 1994 Purple Book the PMRA, although not an arms-length agency, has most of the attributes of one. It is appropriate that this Agency, like the Patent Office, be acknowledged in the legislation. In the previous chapters, we emphasized the need to make the process more open and transparent. In the Committee's opinion, an important step in achieving this goal is to clearly identity the *de facto* decision-maker and set out its role and responsibilities in the new Act.

The Committee recommends that a statutory base be provided to the Pest Management Regulatory Agency in the new Pest Control Act and that its role and responsibilities be clearly defined.

A Strengthened Mandate for the PMRA

15.8 When the PMRA was created in 1995, it was given the following mandate:

> To protect human health and the environment by minimizing the risks associated with pest control products, while enabling access to pest management tools, namely these products and sustainable pest management strategies.

15.9 This is the mandate that the Pesticide Registration Review Team recommended for the PMRA in the 1990 Blue Book. It is also the mandate the federal government indicated would be given to the Agency in the 1994 Purple Book.

15.10 In the opinion of the Committee, this mandate is unacceptably weak. It essentially states that, in protecting human health and the environment, the PMRA need go no further than to "minimize" the risks associated with pesticides. It seems to the Committee that, at a minimum, the PMRA should be directed to "eliminate the risks associated with pesticides to the greatest extent possible." Furthermore, at the same time that the PMRA is directed to protect human health and the environment by minimizing the risks associated with pesticides, it is also directed to "enable access" to pesticides as opposed to, for example, "enable access to safer pesticides." Given that the PMRA is directed both to protect human health and the environment *and* to make pesticides available, it is small wonder that concerns have been raised about its "dual" mandate, particularly when no clear priority is given to minimizing risks to human health and the environment over access to pesticides. Both interests appear to be placed on an equal footing and require a delicate balancing. This is essentially what the Minister of Health said in the House of Commons when responding to a question raised by a Member of Parliament:

> As the Member knows, the PMRA has to balance public safety and environmental concerns against the needs of producers and growers.[259]

15.11 In the opinion of the Committee, the PMRA's dual mandate sends out decidedly "mixed" signals. These signals are even more mixed in light of the goals the federal government has set for the Agency. The PMRA is directed not only to promote health, safety and the environment and support the integration of pest management with the broader goals of environmental sustainability — goals with which the Committee wholeheartedly agrees — it is also directed to support the competitiveness of agriculture, forestry, other resource sectors and manufacturing, and to regulate cost-effectively in an open and transparent manner.[260]

15.12 The Committee is seriously concerned about the divergent goals of the PMRA. Industry competitiveness and cost-effectiveness should not be given such prominence. In our experience, these goals compete too often with the goals of protecting human health and the environment; when decisions are made, the latter goals too often fail to come out on top.

15.13 To a certain extent, the PMRA is already a captive of the pesticide industry. The Agency must rely on the data supplied by pesticide manufacturers in assessing whether or not to register their products since it has no independent, in-house testing capacity. The Agency must also rely on the registration fees provided by pesticide manufacturers under its cost recovery program (discussed in greater detail in the Chapter entitled "The Funding Dilemma"). The cost recovery fees collected by the PMRA represent approximately 30% of the Agency's operating budget. The PMRA's heavy reliance on registration fees to carry out its functions has of course given rise to concerns that its priorities might be skewed in favour of its revenue-generating activities (e.g. registering pesticides) over those that do not generate revenue (e.g. promoting alternatives to pesticides, re-evaluating older pesticides and educating the public about the risks of pesticide use). This point was aptly made by Julia Langer of the World Wildlife Fund, who stated:

> [I]t is really more a matter of their priorities, their legislative abilities, their will, the direction they've been given and who really are their clients and what are their priorities...They also

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[259] House of Commons, *Hansard*, No. 233, May 28, 1999.

[260] *Government Proposal for the Pest Management Regulatory System*, October 1994.

> have an inherent problem, however, with how they're financed. Nobody likes cost recovery, not the industry and not the folks on our side of the table, because cost recovery is a recipe for continuing use. If your budget is tied to registering pesticides and having pesticides on the market, there's not that much incentive to actually reduce them, because then your budget disappears.[261]

15.14 The Canadian Labour Congress (CLC) was even more critical of the PMRA. In terms of overall performance, the CLC gave the Agency a D minus, remarking that the PMRA "utterly fails in the one device it has within its power to avoid the creation of chemical pollution, pollution that would be regarded and classified as extremely hazardous toxic waste were it produced and disseminated in any other context but its legal use under the PCPA."[262] The Sierra Club of Canada further observed that one of the major problems with the PMRA was that when administrative responsibility for the Act was transferred from Agriculture Canada to Health Canada in 1995, there was no concomitant culture change since the staff remained largely the same:

> We had pretty high hopes when the responsibility for the *Pest Control Products Act* was moved out of Agriculture Canada and into Health Canada, thinking we were shifting the focus from promoting agricultural products to protecting health. Largely it was just a change of name. A lot of the staff remained the same, and the culture tended to remain the same.[263]

15.15 Based on the evidence before us, the Committee cannot quarrel with this assessment. The fact that responsibility for the Act was transferred to Health Canada should make a difference; it should, in fact, make a big difference. Otherwise, what is the point? We agree with Dr. Kelly Martin of the Canadian Association of Physicians for the Environment that what is needed is some clearly imposed action on the PMRA to protect Canadians on a health basis. She stated:

> They are now under the auspices of the Health Protection Branch. They don't know it, but they are. That's their role. Yes, they want to keep Canadians competitive, but they're there to protect Canadian's health interests. When we have the evidence we have, they have to be forced to act in a responsible way.[264]

15.16 In the opinion of the Committee, one of the root problems with the PMRA is its weak and equivocal mandate. Protecting human health and the environment must be given priority over all else. The Committee notes the mission of the Office of Pesticide Programs (OPP). The OPP is the body within the US Environmental Protection Agency that is responsible for registering and regulating pesticides in that country. Its mission statement is:

> To protect public health and the environment from the risks posed by pesticides and to promote safer means of pest control.[265]

15.17 The Committee proposes a similar, strengthened mandate for the PMRA, which gives top priority to the protection of human health and the environment and which promotes the use of safer

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[261] *Evidence*, Meeting No. 129, June 10, 1999.

[262] *Evidence*, Meeting No. 7, November 23, 1999.

[263] *Evidence* , Meeting No. 5, November 17, 1999.

[264] *Evidence*, Meeting No. 11, December 1,1999.

[265] United States Environmental Protection Agency, Web site, Office of Pesticide Programs, *Major Activity Areas of the Office of Pesticide Programs*, January 2000.

systems of pest management. In addition, we believe that the PMRA should be mandated to heighten public awareness about the risks of pesticide use. Throughout this report, we have emphasized the importance of educating and informing the public about pesticides, the risks they pose or might pose, and the desirability of developing and using safer alternatives. Education is key to changing the public's attitude about pesticides and we foresee a major role for the PMRA in this respect.

15.18 In Chapter 2, the Committee set out four principles that should form the basis of the new pesticides Act. These principles, in our opinion, should also form part of the mandate that should be enacted in relation to the PMRA.

The Committee recommends that the Pest Management Regulatory Agency be given the following priorities in its mandate under the new Pest Control Act:

(a) give absolute priority to the protection of human health and the environment when considering whether to approve a pesticide for use in Canada or allow its continued use;

(b) promote the use of sustainable pest management strategies that seek to reduce use, risk and reliance on pesticides;

(c) emphasize the development of safer pest control products; and

(d) inform and educate the public about pesticides and the risks associated with their use.

The Advisory Bodies

15.19 Three separate bodies — the Federal/Provincial/Territorial Committee on Pest Management and Pesticides, the Pest Management Advisory Council and the Economic Management Advisory Committee — are involved in providing advice on pest management issues to the PMRA or the Minister. Their mandates are as follows:

- The Federal/Provincial/Territorial Committee on Pest Management and Pesticides was established in 1997 to strengthen federal/provincial/territorial relationships in the area of pest management and pesticides, promote the exchange of information in these areas, and provide advice and direction to the federal, provincial and territorial governments on programs, policies and issues for pesticides with the aim of enhancing sustainable pest control practices and to seek harmonization where applicable in programs and policies. The Committee currently consists of two officials from the PMRA, two officials from each province and one official from each territory.[266] The Federal/Provincial/Territorial Committee on Pest Management and Pesticides replaced two former federal/provincial/territorial bodies, namely the Canadian Association of Pesticide Control Officials (CAPCO) and the Federal-Provincial-Territorial Standing Committee on Pest Management.

[266] Pest Management Regulatory Agency, Web site. Although the three territories currently have only one representative on the Committee, they are entitled to send two officials. The American Association of American Pesticide Control Officials may also send a representative, January 2000.

- The Pest Management Advisory Council (PMAC) is a multi-disciplinary body established in November 1998 to foster communication and dialogue between stakeholders and the PMRA and to provide advice to the Minister of Health on policies and issues relating to the federal pest management regulatory system. It consists of approximately 25 members, including representatives from the health, environmental, labour, consumer, academic, horticultural, agricultural and pesticide-manufacturing sectors.

Pest Management Advisory Council Membership

The current membership of the Pest Management Advisory Council consists of representatives or persons from the following institutions and organizations (alphabetical order):

Canadian Association of Physicians for the Environment
Canadian Centre for Occupational Health and Safety
Canadian Environmental Law Association
Canadian Federation of Agriculture
Canadian Horticultural Council
Canadian Manufacturers of Chemical Specialties Association
Canola Council of Canada
Carleton University (Dr. Richard Van Loon: Chair)
Centre Anti-Poison du Québec
Consumers Association of Canada
Crop Protection Institute
Dalhousie University, Department of Biology
Environmental Management, Pesticide Approvals, Manitoba Environment
Foothills Hospital (Calgary), Department of Obstetrics and Gynecology
Learning Disabilities Association of Canada
National Forest Pest Management Caucus, New Brunswick Department of Natural Resources and Energy
Pest Management Regulatory Agency
Philom Bios
Sierra Club of Canada
Simon Fraser University, Centre for Environmental Biology
University of Guelph, Department of Agricultural Economics and Business
World Wildlife Fund

- The Economic Management Advisory Committee (EMAC) was established in April 1997 to advise the PMRA on specific ways to improve efficiency and cost effectiveness without compromising health or environmental protection while maintaining industry competitiveness. This 13-member committee is comprised primarily of representatives from the agricultural and pesticide-manufacturing sectors.

Economic Management Advisory
Committee Membership

The current membership of the Economic Management Advisory Committee consists of representatives and persons from the following institutions and associations (alphabetical order):

Members

Agricore
BASF Canada Inc.
Canadian Animal Health Institute
Canadian Federation of Agriculture (2 representatives)
Canadian Manufacturers of Chemical Specialties
Crop Protection Advisory Committee
Crop Protection Institute
DowAgro Sciences Canada Inc.
Nu-gro Consumer & Professional Products Division
Pest Management Regulatory Agency (3 representatives)

Alternates

Canadian Horticultural Council
Canadian Federation of Agriculture
Canadian Manufacturers of Chemical Specialties

15.20 Given that each level of government plays a role in the management of pest control products in Canada, the Committee takes note of the mandate of the Federal/Provincial/Territorial Committee, which is intended to promote and facilitate co-operative action. The Committee also welcomes the formation of the Pest Management Advisory Council. The broad-based membership of the Council as well as its general terms of reference should ensure that a more comprehensive and balanced approach is taken in pest management decisions. On the other hand, the Committee has deep concerns about the Economic Management Advisory Committee. The sole purpose of this body is to advise the PMRA on specific ways to improve efficiency and cost effectiveness. Although the Economic Management Advisory Committee is directed to do this "without compromising health or environmental protection and while maintaining industry competitiveness," the overall thrust of its mandate is undeniably an economic one.

15.21 The Committee is aware that economic considerations play an important role in the decision-making process. The problem is that, too often, they play the predominant role. In the Committee's

opinion, the separate existence of the Economic Management Advisory Committee to advise the PMRA on efficiency, cost-effectiveness and competitiveness unduly tilts the balance in favour of trade and economics. As we stated earlier, the protection of human health and the environment must be given pre-eminence, particularly in view of the fact that the PMRA is now part of the Department of Health, rather than Agriculture and Agri-Food Canada.

15.22 It should be noted that many of the associations represented on the Economic Management Advisory Committee are also represented on the Pest Management Advisory Council. Representatives of the Crop Protection Institute, the Canadian Manufacturers of Chemical Specialities and the Canadian Federation of Agriculture sit on both advisory bodies. In addition, a representative from the Canadian Horticultural Council, who is an alternate member on the Economic Management Advisory Committee, sits as a full member on the Pest Management Advisory Council. The Economic Management Advisory Committee, on the other hand, has no representation whatsoever from the health, environmental and consumer sectors.

15.23 Given the existence of these two advisory bodies and the one-sided membership of the Economic Management Advisory Committee, the Committee is concerned that inconsistent and possibly conflicting advice might be given to the decision-makers although, technically speaking, the Economic Management Advisory Committee reports to the PMRA while the Pest Management Advisory Council reports to the Minister. In order to ensure consistency in the advice that is provided, the Committee believes the Economic Management Advisory Committee should be dissolved and its functions added to the mandate of the Pest Management Advisory Council. The farming and industry sectors are already represented on this Council; their specific interests are thus already heard and considered. To maintain the Economic Management Advisory Committee is unnecessary under the circumstances. In the opinion of the Committee, the Pest Management Advisory Council with its broad-based membership currently has the capacity to address economic issues and should be able to provide a more comprehensive approach to policy direction.

15.24 The Committee was very encouraged by the statement of the Minister of Health who indicated to us that he "did not feel strongly" about folding the Economic Management Advisory Committee into the Pest Management Advisory Council. We fully agree with the Minister's statement that "what we should have is a good vigorous advisory committee where all the interests are at the table".[267]

The Committee recommends a restructuring of the advisory bodies, specifically that:

(a) the Economic Management Advisory Committee be dissolved and its functions be taken over by the Pest Management Advisory Council;

(b) the Federal/Provincial/Territorial Committee on Pest Management and Pesticides and the Pest Management Advisory Council be officially recognized in the new Pest Control Act and their mandates be defined;

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[267] *Evidence*, Meeting No. 23, February 17, 2000.

(c) the mandate of the Pest Management Advisory Council explicitly provide that absolute priority be given to the protection of human health and the environment; and

(d) the broad-based membership of the Pest Management Advisory Council be explicitly retained in the new Pest Control Act.

Improved Information Sharing

15.25 When the PMRA was created in 1995 it was given sole regulatory authority over pest control products, while the other federal departments which had previously been involved in the pesticide registration processes were left with important research and monitoring functions. The input of these departments into the current system, however, has been largely thwarted by the PMRA's unresponsiveness and lack of co-operation. This problem was first brought to the attention of the Committee by the Commissioner of the Environment and Sustainable Development who observed in his 1999 report that the PMRA had gained the reputation of being a "closed shop" and was perceived not to welcome the input from other federal departments:

> Overall, we have significant concerns about the lack of co-operation between the PMRA and the departments that undertake scientific research activities. There is little evidence that the departments and the PMRA, on a routine and regular basis, discuss their work or share their findings and set priorities for subsequent work. The PMRA has gained a reputation as a "closed shop" and is perceived not to welcome input from other federal departments.[268]

15.26 The PMRA's "closed shop" mentality was reiterated by many witnesses, including Dr. Pierre Mineau, a research scientist with Environment Canada. Noting that the PMRA was set up as an independent body, Dr. Mineau observed that the Agency "has taken its role very seriously, to the point of shutting out others."[269] He described to the Committee some of the practical problems encountered with the PMRA over the years in terms of information sharing and consultation on policies and actions, not the least of which was the ten year struggle with the Agency (and its predecessor) to have the granular formulation of carbofuran banned because of its undeniable, lethal effect on birds.

15.27 Dr. Bernard Hill, environmental chemist with Agriculture and Agri-Food Canada testified in turn that when the PMRA took over, all contact ceased with registration officials at the PMRA. He stated that the policy seemed to become one of "no communication" except perhaps when a problem arose; only then would the PMRA seek input. He added that there was no obvious mechanism for submitting data directly to the Agency and that explanations on individual registration decisions had become difficult to obtain.[270] Although these witnesses pointed out that some improvements had been made recently to re-establish the lines of communication with the PMRA, the Committee is not satisfied that this is occurring quickly enough.

15.28 The Commissioner of the Environment and Sustainable Development identified the PMRA's lack of information-sharing on pesticides with other federal departments as one of the major obstacles to interdepartmental co-operation. He described the inability of Environment Canada to obtain basic

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[268] Report of the Commissioner of the Environment and Sustainable Development, Chapter 3, 1999.
[269] *Evidence*, Meeting No. 12, December 2, 1999.
[270] *Evidence*, Meeting No. 12, December 2, 1999.

information on the composition of pesticides from the PMRA to properly target research on the environmental effects of these products.[271] The Committee heard first hand from officials at Environment Canada, as well as from other federal departments, about the PMRA's refusal to share information with them. For example, officials from the Department of Indian and Northern Affairs informed us that their department had been denied information on the pesticide "lindane" which was being sought to assist that department in international negotiations regarding a POPs (persistent organic pollutants) treaty.[272]

15.29 The problem of information sharing is not limited to federal departments. Provincial and territorial governments have also been unable to obtain required information from the PMRA. This point was made forcefully to the Committee by senior officials from Prince Edward Island's Department of Technology and Environment, who appeared before the Committee on December 8, 1999. These officials described the problems encountered by their department in trying to obtain pesticide information from the PMRA to investigate the various fish kills that had occurred in PEI. They indicated that some information, like post-mortem diagnostic data, was simply not available. Conversely, some information was provided, but not always in a timely fashion; it took them about one month to obtain a report that had been recently completed on a specific pesticide pursuant to a special review. Moreover, they were unable to obtain information that the PMRA had in hand on the grounds that it was confidential business information. Mr. Bill Drost, Deputy Minister of Technology and Environment, stated in this regard:

> [The] most frustrating and disturbing aspect was being told that the information we requested exists, but that the PMRA was unable to provide the information because of confidentiality agreements with the pesticide manufacturers. We were told we would have to request this information from the pesticide manufacturers themselves. In this case, the company was in California. There is a problem when we must rely on the willingness of the company that manufacturers the product that we are investigating, to disclose information that could potentially be detrimental to the company and the image of its product. Mr. Chairman, with all due respect to the confidentiality issue, there must be a way found to allow investigative authorities like ourselves access to such critical information such as toxicity information on these products.[273]

15.30 The PMRA informed the Committee that by virtue of the confidentiality provisions of the *Access to Information Act*, it is unable to share with other federal departments the confidential business information it receives in relation to pesticides.[274] Given the testimony of the PEI officials, the PMRA's policy of non-disclosure obviously extends to provincial and territorial governments as well.

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[271] Report of the Commissioner of the Environment and Sustainable Development, *Federal House*, Chapter 3, 1999.

[272] *Evidence*, Meeting No. 16, December 14, 1999.

[273] *Evidence*, Meeting No. 14, December 8, 1999.

[274] *Evidence*, Meeting No. 126, June 1, 1999; Report of the Commissioner of the Environment and Sustainable Development, Chapter 3, 1999.

15.31 The Committee is aware of restrictions regarding confidential business information under the *Access to Information Act*, which were outlined in Chapter 13. Based on the legal opinion that we obtained, it is clear that these statutory restrictions do *not* apply to the governments and government departments within Canada. They apply exclusively to individual Canadians and Canadian corporations.[275] The legal opinion indicated, however, that there are some impediments at common law.[276] We were advised in this regard, that there is a duty at common law for the recipient of information provided in confidence to protect the confidentiality of the information. Failure to do so could result in an action for breach of confidence, particularly if the confidential information is used for a purpose other than that for which it was provided. For example, if the PMRA receives confidential business information in support of a registration application and subsequently releases the information to environmental officials investigating a suspicious fish kill, the disclosure, in such a case, would serve a different purpose (i.e. investigation) from that for which the information was intended (i.e. registration). By providing confidential business information for an unauthorized purpose, the PMRA would be open to a breach of confidence action at common law. The common law, however, also recognizes a "public interest" defence. Unfortunately, there is very little Canadian jurisprudence on when the public interest defence might be successfully invoked. A compelling case could nonetheless be made that the PMRA, by providing environmental officials with confidential information to assist them in an investigation, was acting in the public interest and consequently should not be held liable for breach of confidence.

15.32 Whether the PMRA would be successful in invoking the public interest defence is speculative. It has never been necessary to put this issue to the test, given that the PMRA was apparently under the mistaken impression that the restrictions under the *Access to Information Act* precluded exchanges of confidential business information with other government agencies.

15.33 During her appearance before the Committee on June 1, 1999, Dr. Franklin of the PMRA suggested that the current constraints regarding information sharing with other departments would be obviated in the forthcoming legislation. She stated, "We certainly are anticipating being in a different position with amendments to the legislation so that in the future we would not be constrained in the way in which we currently are."[277] As the Committee noted in Chapter 13, among the amendments recommended by the PMRA is a proposal to modify the Act to allow the disclosure of confidential business information to other government departments to respond to situations endangering health or the environment and to other regulatory authorities with whom an agreement has been signed regarding the exchange of information about pest control products.[278]

15.34 In the Committee's opinion, there should be a policy of complete information-sharing with other federal, provincial and territorial departments and agencies. Provided confidentiality is maintained and the information is relevant to the work of these departments and agencies, the Committee sees no reason why access should be denied to them. The greater the input into the decision-making process, the more informed the decisions of government are likely to be.

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[275] J. Craig, *Questions regarding Access to Information Held by the Pest Management Regulatory Agency : The Federal Access to Information Act and the Common Law Duty of Confidentiality*, Parliamentary Research Branch, Library of Parliament, January 26, 2000.

[276] The term "common law" essentially refers to the ancient rules of English law embodied in judicial decisions. The common law is the opposite of "statute law," which refers to the legislation enacted by Parliament.

[277] *Evidence*, Meeting No. 126, June 1, 1999.

[278] Pest Management Regulatory Agency, *Proposed Amendments to the Pest Control Products Act*, January 1999.

15.35 The Committee recommended earlier in this report that legislation to replace the current *Pest Control Products Act* be introduced in Parliament as a matter of top priority, but it may take some time before the new legislation is actually passed and proclaimed in force. Corrective action, however, is needed now. The exchange of information is a major component of the memoranda of understanding signed by the PMRA and the sectoral departments (discussed next). As the Commissioner pointed out, the lack of information sharing has been a major stumbling block to interdepartmental co-operation. In the Committee's opinion, this problem must be fixed immediately; it need not await a legislated solution.

The Committee recommends that:

(a) the new Pest Control Act expressly authorize the disclosure by the Pest Management Regulatory Agency of confidential information, including confidential business information, to other federal, provincial and territorial departments and agencies that require the information in the course of their duties, subject to their maintaining the confidentiality of the information;

(b) as an interim measure, the Pest Management Regulatory Agency develop forthwith the broadest possible policy permitted at common law on the disclosure of confidential information, including confidential business information, to other federal, provincial and territorial departments and agencies that require the information in the course of their duties, subject to their maintaining the confidentiality of the information; and

(c) the Minister of Health ensure that the Pest Management Regulatory Agency implements such a policy no later than 60 days from the tabling of this report in the House of Commons.

Inter-Departmental Memoranda of Understanding

15.36 In recognition of their interrelated roles, the PMRA and selected sectoral departments signed memoranda of understanding (MOU) in relation to pest management issues. These MOUs are intended to foster a strong working relationship between the parties by delineating their respective responsibilities and identifying areas of mutual interest. A common thread in the agreements is the exchange of information and advice and the promotion of sustainable development through the development of alternative pest management practices and risk reduction strategies. The PMRA signed an MOU with the Department of Agriculture and Agri-Food, the Department of Natural Resources and the Department of Health (Health Protection Branch) in 1996. A further memorandum was signed with Environment Canada in 1998.

15.37 The Committee supports these agreements in principle since they are designed to promote and facilitate inter-departmental cooperation. We are convinced that had the MOUs been implemented, both in spirit as well as the letter, many of the concerns brought to our attention would not have arisen in the first place.

15.38 Although the content of the MOUs might be praiseworthy in some cases, the Committee deplores the process under which these administrative agreements are negotiated and signed. We note that the MOUs in question were signed not by the responsible Ministers, but by senior bureaucrats,

namely the PMRA's Executive Director and the relevant Assistant Deputy Ministers. They were also negotiated behind closed doors. The public was not given an opportunity for input before the agreements were finalized. The public was not even made aware of their existence. In addition, there is no requirement under the agreements to monitor compliance or gauge effectiveness. The MOUs signed with Natural Resources Canada and Agriculture and Agri-Food Canada simply require that the parties — usually the bureaucrats who signed the MOU — get together once a year "during the normal planning process." An annual meeting is not even required under the MOU concluded with the Health Protection Branch at Health Canada; this agreement simply calls on the parties to meet annually to review the agreement "if required." The MOU with Environment Canada is the only one of the four that specifically requires the parties to review the agreement 24 months after signing to "determine its adequacy."

15.39 In the opinion of the Committee, these MOUs completely fail to satisfy the dual principles of transparency and public accountability. In previous chapters, we discussed the importance of having an open and transparent process to foster public confidence in the system. Given that these MOUs are an important component of the overall pesticide regime in this country, it is essential that they be subject to public scrutiny and input before they are finalized. In Chapter 13, we recommended the establishment of an electronic public registry of information. Such a registry, in our opinion, would be the ideal vehicle for informing the public about proposed MOUs. If these agreements were disseminated by such means, the public would have notice of them and would have the opportunity to comment on their content. For greater transparency, comments made by the public could also be posted on the registry.

15.40 By recommending the publication of draft MOUs, the Committee recognizes that it is probably breaking new ground. As a rule, the public is not informed that MOUs have been signed, since these agreements are considered "internal" government business. To require the publication of MOUs, even in final form, would be precedent-setting. We believe, however, that it is important that the public be informed about what is being proposed and that it be given a reasonable opportunity to suggest improvements at the draft stage. Transparency of process demands that the public be involved at the earliest opportunity. In making this recommendation, the Committee is essentially following the recommendations of the Deputy Minister Task Force report of December 1996, entitled *Managing Horizontal Policy Issues*. This report sets out a check list of key practices for initiating work on horizontal and strategic issues within federal departments. Two of the practices on the checklist are of particular relevance to this discussion, namely, establishing clear accountability of both lead and partner departments, and developing partnerships with the broader community:

- establishing clear accountability of both lead and partner departments. Particularly when the lead for a horizontal initiative is a line department, definition of clear accountabilities allows the lead department to play a corporate role and exert leadership, while ensuring that partner departments collaborate and develop a sense of ownership for the initiative; and

- developing partnerships with the broader community. External consultation has become an important part of policy development for many departments, and needs to be integrated efficiently and effectively into the policy development process. Partnerships with the broader community (other governments, aboriginal peoples, non-government organizations) should be pursued as a

means of drawing on a wider range of expertise and resources during the policy development process.[279]

15.41 Given this authority, the Committee is reassured that its recommendation to publish draft MOUs falls well within the government guidelines. To ensure full accountability, it is also critical that the MOUs contain an effective review mechanism and that the responsible Ministers, rather than the bureaucrats, take full responsibility for the MOUs by approving their content and signing them personally.

The Committee, deploring the use of memoranda of understanding unless they are developed through a clear and transparent process, recommends that:

(a) before being finalized and signed, all inter-departmental memoranda of understanding negotiated by the Pest Management Regulatory Agency and other departments in relation to pest management issues be published on the electronic public registry and that the public be afforded a thirty-day period for comments;

(b) these memoranda of understanding be revised to ensure that they contain an effective review mechanism; and

(c) the relevant Ministers take full responsibility by approving and signing the agreements.

15.42 A memorandum of understanding was also developed with the Department of Fisheries and Oceans (DFO) but, in contrast to the MOUs negotiated with the other departments, the agreement with the DFO was never concluded because of ongoing disagreements between this department and the PMRA on the use of pesticides in aquaculture and the interface between pesticide use and section 36(3) of the *Fisheries Act*. This section prohibits the deposit of deleterious substances in waters frequented by fish unless specifically allowed under regulations promulgated to that end.

15.43 As the Commissioner of the Environment and Sustainable Development observed in his 1999 report, the *Fisheries Act* is based on a policy of "zero tolerance" whereas the *Pest Control Products Act* allows some level of acceptable risk associated with the use of pesticides. Thus, even though a pesticide may be legally registered for use in Canada, if it enters waters frequented by fish it could run counter to the prohibition under the *Fisheries Act*.[280]

15.44 The testimony of officials from the PMRA regarding the use of the herbicide Acrolein highlighted the important divergence of opinion and approach between the PMRA and the DFO.[281] The PMRA sanctions the use of Acrolein to control weeds in irrigation canals. The DFO has warned the PMRA against using Acrolein in these canals because the herbicide is known to harm or kill fish. The PMRA has taken the position that irrigation canals are not fish habitat. The DFO, on the other

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[279] Canadian Centre for Management Development, Web site, Deputy Minister Task Forces, *Managing Horizontal Policy Issues*, December 1996.

[280] Report of the Commissioner of the Environment and Sustainable Development, Chapter 3, 1999.

[281] *Evidence*, Meeting No. 126, June 1, 1999; *Evidence*, Meeting No. 2, November 2, 1999.

hand, maintains that the very fact that the fish are harmed or killed as a result of this usage triggers the application of section 36(3) of the *Fisheries Act* and should therefore preclude the use of Acrolein in irrigation canals.

15.45 In the Committee's view, environmental and health protection must always take precedence over other interests, especially when relevant provisions of federal statutes apply. The precautionary principle should always rule in cases of divergence between federal departments and agencies.

The Committee recommends that in the event of a disagreement between federal agencies and departments regarding the use of a pesticide, the new Pest Control Act explicitly require the application of the precautionary principle to give priority to the protection of human health and the environment.

15.46 During her appearance before the Committee on June 1, 1999, Dr. Franklin indicated that the PMRA and the DFO were hard at work to resolve their differences. She expressed the hope that a MOU would be signed by the fall of 1999. This did not occur, however, and the matter is still under discussion. The Committee is concerned that the PMRA and the DFO have been at an impasse for so long. The Commissioner of the Environment and Sustainable Development also expressed concern about their continued disagreement and recommended in his 1999 report that the parties proceed forthwith to resolve their differences and take co-operative action.[282] The Committee joins the Commissioner in making this recommendation. In our opinion, the PMRA and the DFO should be partners and not foes in the quest for sustainable pest management strategy. They should forthwith conclude their MOU and redirect their energies to ensuring its effective implementation. Furthermore, the PMRA and the other sectoral departments should turn a new page and ensure that their MOUs are being effectively implemented.

The Committee, reiterating the concerns expressed by the Commissioner of the Environment and Sustainable Development regarding the failure of the Pest Management Regulatory Agency and Fisheries and Oceans Canada to resolve their differences and take co-operative action, recommends that the Pest Management Regulatory Agency and Fisheries and Oceans Canada proceed forthwith to conclude a Memorandum of Understanding in relation to pest management issues in fisheries and aquaculture and that the agreement negotiated by them be approved and signed by their respective Minister.

The Committee recommends that the Pest Management Regulatory Agency and the sectoral departments take immediate steps to implement the provisions of their respective Memoranda of Understanding.

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[282] Report of the Commissioner of the Environment and Sustainable Development, Chapter 3, 1999.

Toronto Star

16. INTERNATIONAL HARMONIZATION

16.1 The PMRA is currently working with its counterparts in other countries to harmonize the processes used to regulate pest control products. The aims of harmonization include standardization of the type and scope of studies required to register a pesticide, the protocol followed in carrying out these required studies, the format and presentation of the submissions provided in support of a registration application, and the methods used to evaluate submissions and prepare reports.

16.2 Most notably, the PMRA is pursuing a wide range of initiatives with the United States and Mexico through the Technical Working Group on Pesticides, established under the North American Free Trade Agreement (the NAFTA TWG). The NAFTA TWG met for the first time in March 1996; its aim is to create a more consistent basis for pesticide registration by the year 2002. Targets for harmonizing pesticide regulatory processes in the NAFTA countries include:

- developing common data submissions for manufacturers;
- providing greater co-ordination of approval processes for pesticides;
- eliminating trade problems related to differences in maximum residue limits;
- developing a common labelling system; and
- providing concurrent access to products.

16.3 Harmonization initiatives are also being pursued through the Organization for Economic Co-operation and Development (OECD) Pesticides Forum. Current efforts of the OECD Pesticides Forum are focused on developing a common format for industry data submissions and country review reports, a compatible electronic data submission and review process, common data sets and evaluation criteria, common data requirements for pheromones and microbials, comprehensive summary requirements, test guidelines and effective risk reduction initiatives.[283]

16.4 Many witnesses expressed support for the PMRA's harmonization initiatives. Dr. Kelly Martin of the Canadian Association of Physicians for the Environment, for example, saw great merit in harmonization because it called for information sharing and tended generally to push Canada upward in risk assessment. She remarked:

> To me harmonization has great merit. It is sharing information. Why are we re-inventing the wheel? I think harmonization in fact is pushing us in risk assessment upward. I think, in general, it probably pushes us upward. [...] Of course Americans will always have a bigger weight. So if we think we want something greater than they have, it will take a lot of political will to do that. I think harmonization is the route to go, with some focus on what research we actually need and want. They are moving faster towards that than we are, so it could be quite helpful.[284]

16.5 Denise Dewar of the Crop Protection Institute also stated that in her experience, international harmonization had pushed the bar higher.[285] On the other hand, Barbara McElgunn of the Learning Disabilities Association of Canada informed the Committee that, in at least one instance, the Canadian standard had been lowered due to harmonization. She indicated that the PMRA had changed the maximum residue limit (MRL) for chlorpyrifos from 0.1 parts per million to 1.0 parts per million to harmonize with the US.[286]

16.6 While many witnesses endorsed harmonization, a majority of them had serious concerns that Canadian standards might be lowered in the process. Some standards might be eliminated altogether. For example, there are current discussions within the Economic Advisory Council to possibly eliminate the requirement for the PMRA to conduct "efficacy reviews" since such reviews are not generally required in the US.

16.7 The World Wildlife Fund told the Committee that the NAFTA process was dominating pesticide related initiatives in Canada. Stating that harmonization was being offered as the way to gain efficiencies, conduct cheaper re-evaluations, get lower-risk pesticides on the market and resolve so-called trade irritants, this organization felt that although work-sharing and avoiding duplication were commendable objectives, registering pesticides more quickly and cheaply and avoiding differences simply because they might impede trade were less worthy. It recommended that the PMRA be given a clear, health and environment driven negotiating position.[287] The Canadian Environment Law Association and the Ontario College of Family Physicians, for their part, were particularly concerned

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[283] Pest Management Regulatory Agency, Web site, The information on international harmonization was drawn from a fact sheet prepared by the PMRA, entitled *Fact Sheet on International Harmonization of Pesticide Regulation*, November 1999.

[284] *Evidence*, Meeting No. 11, December 1,1999.

[285] *Evidence*, Meeting No. 9, November 25, 1999.

[286] *Evidence*, Meeting No. 4, November 16, 1999.

[287] World Wildlife Fund, Brief to the Committee.

about the possible lowering of Canada's maximum residue limit (MRL) standards through harmonization. They recommended that the PMRA ensure that the negotiation of MRLs with our trading partners be effected under a transparent process and that the strength of Canada's MRLs not be compromised.[288]

16.8 The Committee agrees with these recommendations. Throughout this report we have stressed the importance of ensuring that protection of human health and the environment is given top priority. We have also emphasized the importance of having an open and transparent process. These fundamental principles must drive the harmonization process, not be subordinated by it. The Committee strongly opposes any initiative that might lower Canadian standards on the grounds of expediency. It is imperative that our standards not be relaxed. We must ensure that only the most protective standards are applied.

The Committee recommends that a clause be added in the operative sections of the new Pest Control Act requiring that protection of human health and the environment according to the precautionary principle be the sole objective of any action to harmonize Canadian standards with those of other countries, and that such standards not be weakened in any way.

The Committee recommends that the harmonization process be fully transparent by requiring that all harmonization negotiations and actions be reported on the Pest Management Regulatory Agency's electronic public registry of information.

[288] Canadian Environment Law Association and Ontario College of Family Physicians, Brief to the Committee.

Nature-Action Québec

17. THE FUNDING DILEMMA

The PMRA's Budget and Cost Recovery Fees

17.1 The PMRA's expenditures for fiscal year 1998/1999 were $26.7 million. Of this total, approximately $7.8 million was generated through cost recovery fees. Roughly $7.5 million in fees was collected for fiscal year 1997/1998, out of an operating budget of $24.8 million. A total of $8.5 million in cost recovery fees is forecast for fiscal year 1999/2000, with a projected budget of $28.3 million.[289] For comparison purposes, these figures are set out in Table 17.1.

[289] Correspondence to the Committee, Pest Management Regulatory Agency, February 14, 2000.

Table 17.1: Pest Management Regulator Agency
Total Expenditures, Including Revenues from Cost Recovery Fees
($millions)

FISCAL YEAR	1995/1996	1996/1997	1997/1998	1998/1999	1999/2000 (forecast)
Revenues from cost recovery fees	N/A	N/A	$7.5	$7.8	$8.5
Total Expenditures	$21.5	$24.8	$24.8	$26.7	$28.3

17.2 Cost recovery fees were introduced by regulation in 1997.[290] These fees are charged for the majority of registration applications, and are payable at the beginning of each step of the examination process: 10% is payable at the time of application, 25% is payable when the application has been accepted for preliminary review, and 65% is payable when the application has been accepted for evaluation. Specified fees are charged for each component of the examination process. As indicated in Table 17.2, fees range from $154 for a certain type of label review, to $98,248 for a review of the toxicological data accompanying an application to register a pesticide with a new active ingredient.

17.3 The fees are payable irrespective of whether or not the product is eventually registered. An application for registration involving a new active ingredient can cost in the neighbourhood of $228,000. Provision is made, however, for reduced application fees in eligible cases to facilitate access to the Canadian market for low volume, niche products. There are also fee exemptions for certain types of applications. For example, fees are not charged for the review of data respecting biopesticides, although there are modest fees for such things as label reviews ($154 to $262), certificate renewals ($154) and research permits ($150).

17.4 An annual maintenance fee of $2,690 per registered product is also charged for the right to manufacture or sell the product in Canada, but an application may be made for a reduced fee if product sales are lower than $89,667. Products with sales below $2,500 pay a minimum fee of $75 whereas those with sales between $2,500 and $89,667 pay 3% of the sales value for the previous fiscal year.[291]

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[290] The PMRA's current cost recovery fee regime was introduced in April 1997 under the Regulations Prescribing the Fees to be Paid for a Pest Control Product Application Examination Service Provided by or on Behalf of Her Majesty in Right of Canada, for a Right or Privilege to Manufacture or Sell a Pest Control Product in Canada and For Establishing a Maximum Residue Limit in Relation to a Pest Control Product.

[291] The information on cost recovery fees was drawn primarily from: Pest Management Regulatory Agency, *Guidance Document on Pest Control Product Cost Recovery Fees*, April 16, 1997.

Table 17.2: Selected Cost Recovery Fees

Maximum fees payable for the most complex registration applications	(approximately) $228,000
Examples of fees charged for specific components of the evaluation process	
• review of toxicological data accompanying an application to register a product with a new active ingredient	$98,248
• review of environmental fate data for an application to register a product with a new active ingredient	$26,953
• review of exposure data accompanying an application to register a product with a new active ingredient	$24,384
• review of environmental toxicology data for an application to register a product with a new active ingredient	$14,882
• review of residue data	$8,448
• review of metabolism data	$6,034
• review of value and effectiveness data	$906
• review of label accompanying an applicationto register a product with a new active ingredient	$262
• review of other labelling matters	$154
Maximum Annual Registration Maintenance Fees	$2,690

Source: Pest Management Regulatory Agency, *Guidance Document on Pest Control Cost Recovery Fees*, April 16, 1997.

Cost Recovery Fee Shortfalls and the PMRA's Priorities

17.5 For both fiscal years 1997/1998 and 1998/1999, there was a shortfall of $4 million in cost recovery fees, which the PMRA attributed to the payment of lower than anticipated annual maintenance fees. Because of this overall $8 million shortfall, the PMRA delayed its re-evaluation program for older pesticides.[292] As discussed in the Chapter on re-evaluations (Chapter 10), many witnesses were concerned about this delay and urged that the program be adequately funded in its own right and not made contingent on funds generated or saved from other areas. The Committee takes this opportunity to reiterate its earlier recommendation from Chapter 10 to provide adequate funding to this program and ensure that all pre-1995 pesticides are re-evaluated by the year 2006. It is urgent that these older pesticides, some of which have been around for forty years or more, be re-evaluated on the basis of today's more stringent standards, notably the additional safety factor of 10 to take into account the particular vulnerability of children and other sensitive populations.

[292] Correspondence to the Committee, Pest Management Regulatory Agency, January 24, 2000.

17.6 The delay in re-evaluating older pesticides was not the only concern raised by witnesses in relation to the PMRA's cost recovery program. Concern was also expressed that, because the registration of pesticides generates revenues through cost recovery fees, the PMRA was giving priority to registration evaluations over non-revenue generating activities within its mandate. The World Wildlife Fund stated:

> During the cost-recovery negotiations with industry the PMRA had to cut its overall budget. They promised to save money through efficiencies and they also promised to meet industry-driven timelines for registration.
>
> They've had shortfalls for two years in a row. They are seriously cash-strapped. It's activities that do not pay their way, like re-evaluation and development of a pesticide database and adverse effect reporting requirements, that have been pushed to the back burner, re-profiled, so to speak, and will be only implemented if money is saved. This is truly unacceptable.[293]

17.7 This criticism would appear to be borne out in fact. Based on the financial data supplied to the Committee by the PMRA (see Table 17.3), only $0.8 million was spent on "Alternatives" for fiscal year 1998/1999. In contrast, $15.3 million was spent on "Registration" activities. Even if, as the PMRA notes, some of the $2.6 million spent on "Policy" included some activity related to "Alternatives," there is little question that alternatives and other non-revenue generating activities have not been funded to the extent necessary to reflect the PMRA's foremost mandate of protecting human health and the environment. Indeed, the Committee is very concerned that the PMRA has not yet implemented an adverse effects reporting system and a formal risk reduction policy, although the PMRA informs us that some work has begun in both cases.[294]

17.8 The Committee notes that both of these initiatives, as well as the re-evaluation of older pesticides, were included in the federal government's 1994 Purple Book commitments arising from the 1990 Blue Book recommendations of the Pesticide Registration Review Team. We agree with the World Wildlife Fund that it is totally unacceptable that these important initiatives have taken a back seat for so long and further to our concerns, we have made specific recommendations respecting these initiatives in previous chapters (see Chapter 9 for the recommendation on adverse effects reporting and Chapter 11 for the recommendation on the development of a pesticide reduction policy).

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[293] *Evidence*, Meeting No. 129, June 10, 1999.

[294] Correspondence to the Committee, Pest Management Regulatory Agency, February 14, 2000.

Table 17.3: PEST MANAGEMENT REGULATORY AGENCY EXPENDITURES ($000's) 1997-98 to 1999-2000

	Allocation 1997-98 and beyond		Actuals		Forecast
	Purple Book	Final Budget	1997/98	1998/99	1999/2000
Registration					
– New Products (includes reduced risk products)			12.4	12.7	12.8
– Registered Products			2.1	2.6	3.7
Total – Registrations	16.9	14.5	14.5	15.3	16.5
Alternatives Note 1	2.0	2.4	0.9	0.8	1.1
Policy Note 1	2.8		2.1	2.6	2.8
Public Participation, Consultations and Communications	2.8	2.2	1.0	1.4	1.4
Compliance	7.8	5.9	5.1	5.4	4.8
Administration	1.7	2.0	1.2	1.2	1.7
	34.0	27.0	24.8	26.7	28.3 *

Note 1: The Policy line also includes some activity on Alternatives, specifically OECD and NAFTA Alternatives policy development such as risk reduction, joint reviews of reduced risk chemicals and biopesticides and regulatory capacity building in areas such as applicator training, buffer zones for sensitive environments and formulants.

* Reflects part of the recent injection (federal budget 1999) of new funds from the Food Safety and Nutrition Initiative which will enable the Agency to implement an enhanced re-evaluation program.

Source: Table supplied to the Committee by the Pest Management Regulatory Agency.

Cost Recovery Fees: A Possible Disincentive to the Registration of Safer Pesticides

17.9 The PMRA's cost recovery program has also come under criticism because the fees might act as a disincentive to registration in some cases. One member of the Committee was particularly concerned about the plight of smaller companies which blend the chemicals to make up a pesticide but which cannot afford the flat registration fees that the larger companies who develop the product can readily absorb. The Committee also heard from witnesses like the Canadian Horticultural Council that some newer and presumably safer products available in other countries, in particular the US, might not be available in Canada. Given this country's relatively small market size, we were told that it may not be profitable for manufacturers to seek registration in this country, particularly if different or additional data are required in support of the registration application.[295]

17.10 The Committee has received too little evidence on the cost recovery fees to be able to conclude that the fees are hindering registrations in Canada. The related problems of different data requirements and small Canadian market size may be exacerbating the situation. A 1998 report prepared for Health Canada by Nephin Consulting Partners suggests that field-test location and market entry have a bearing on this issue:

> From our interviews, it seems common practice to register a product in the United States first, and to have it available in the USA before an application is submitted in Canada. This is not because it is cheaper to register in the United States, but rather that the field tests typically are done there and thus the product is ready for a US application sooner. A further reason for sequential applications, with the USA first, appears to be mainly that companies want to ensure that the larger market in the United States is in fact open to the product before proceeding at all. Their risk calculation [whether to enter a new market with the product] appears more important than the Canadian application fee. However, some companies have suggested that application fees in the $200,000 range are substantive enough to cause them to re-run their cost benefit analyses.[296]

17.11 The Committee notes that registration fee reductions are available in Canada for new product applications in eligible cases, which can reduce the fees payable to 10% of projected sales.[297] The PMRA also has a "User Requested Minor Use Registration" (URMUR) program in place that allows Canadian users or user groups to sponsor a pesticide for registration in Canada under certain conditions when the anticipated sales volume for the product is not sufficient to persuade its manufacturer to register and sell the product in this country. Fee reductions are also available for URMURs in applicable cases.[298]

17.12 In terms of comparisons, the Regulatory Impact Analysis Statement published with the 1997 regulations that established the PMRA's cost recovery fees indicates that the US had registration fees in

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[295] *Evidence*, Meeting No. 9, November 25, 1999.

[296] Nephin Consulting Partners, *Pest Management Regulatory Agency Benchmarking Study*, Final Report, July 15, 1998, p. 7.7.

[297] Pest Management Regulatory Agency, *Guidance Document on Pest Control Product Cost Recovery Fees*, April 1997.

[298] Pest Management Regulatory Agency, Regulatory Directive, *User Requested Minor Use Registration*, DIR99-05, April 28, 1999.

place for a short period of time in 1988 but, due to a court challenge, the fees were suspended until after September 1997. This suspension was extended to beyond 2001 under the *US Food Quality Protection Act* of 1996. The United Kingdom, on the other hand, combines an annual sales levy with an up-front registration fee. Of the UK Pesticides Safety Directorate's budget of $24.2 million (Can.) for 1995-1996, a total of $13.26 million (or 55%) was recovered from industry, with $11.19 (46.8%) coming from the sales levy at 1.46% of sales, and $2.06 million (8.6%) coming from the registration fees.[299]

17.13 The Nephin Consulting Partners also examined the cost recovery fees charged in the following countries: Australia, Canada, the United Kingdom and the United States. They noted that the US charged only a pesticide tolerance fee to establish tolerances (the equivalent to Canada's maximum residue limit) on raw agricultural commodities and in food commodities, but that the 1999 US Government Budget proposed to re-instate the pesticide registration fees to recover the costs of the Environmental Protection Agency to review registration applications. Subject to the existing exception in the US, the Nephin Consulting Partners concluded that the application fees in Canada demonstrated the widest spread, representing the highest of the four countries for a major new application but the lowest for minor administrative changes. Canada, however, was the only country that allowed a reduction on application fees based on projected low sales volumes.[300] Table 17.4 identifies the fees payable in each country for the registration of a product containing a new active ingredient.

Table 17.4: Fee Comparisons — Application Fees

Registration of a New Active Ingredient	Canada[1]	Australia	United Kingdom	United States of America[3]
– product with a new active ingredient, food use	$228,832	$20,000	$149,000	$95,000 (tolerance level only)
– new product use, non-food	$58,191	$12,000	$97,000	$0
– user requested minor use registration (minimum fee)	$22,883	N/A	$1,142	N/A
– exempted products[2]	$262			

1 The fee indicated for Canada represents the maximum payable; fee reductions are possible based on the projected sales over the first three years. The minimum fee for a new product based on a new active ingredient could be as low as 10% of the amount shown in the table. The fee shown for a user requested minor use registration reflects the minimum 10%.

2 Several types of products are exempt from most application fees in Canada.

3 The tolerance processing fee shown for the USA would be the minimum amount payable and could be higher depending on the number of food crops involved.

Source: Nephin Consulting Partners, *Pest Management Regulatory Agency Benchmarking Study*, Final Report, July 15, 1998.

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[299] Regulatory Impact Analysis Statement, *Canada Gazette, Part II*, April 8, 1997 (SOR/97-173).

[300] Nephin Consulting Partners, *Pest Management Regulatory Agency Benchmarking Study*, Final Report, July 15, 1998.

17.14 Based on these data, it would seem that initial registrations are generally more costly in Canada than in the other countries. The Nephin Consulting Partners pointed out, however, that the post-registration fees in each country (i.e. annual maintenance fees or sales levy, etc., depending on the scheme adopted) were generally lower in Canada than in the other countries (see Table 17.5). When these fees were added to the initial registration fees and calculated over a 15-year hypothetical period, the Nephin Consulting Partners concluded that the total fees paid in Canada were somewhat below those payable in the US, the UK and Australia for products with moderate to high sales levels (sales of $500,000 and over per year), but they were substantially higher than those payable in the other countries for products with low sales levels (sales of $75,000 per year).[301]

Table 17.5: Maximum Annual Fees Payable by Product or Company

Maximum Annual Fees	Canada	Australia	United Kingdom	United States of America	
				Federal	State[1]
– per product	$2,690	$25,000	no maximum	$2,750	no max
– per registrant	no maximum	no maximum	no maximum	$138,000	no max

[1] In the U.S. there is a cost of $9,800 to register a product in all 50 states plus a sales levy in California which does not have a cap.

(Source: Nephin Consulting Partners, *Pest Management Regulatory Agency Benchmarking Study*, Final Report, July 15, 1998.)

The Need to Review the Cost Recovery Program

17.15 The Committee has not had the opportunity to study the issue of cost recovery more closely. Consequently, we are not in a position to conclude that the PMRAs cost recovery fees should be retained, eliminated or altered. Some Committee members support the government's cost recovery policy and favour retaining the user fees. Other members oppose the policy and call for the elimination of the fees. Still others favour eliminating the fees but only if the PMRA's budget allocation is increased commensurately to make up for the revenue shortfall.

17.16 The federal government stated in the Purple Book that an important consideration in designing the PMRA's cost recovery regime would be to avoid deterring the registration of pest control products, particularly minor use products and alternatives to traditional chemical products, or otherwise putting pest control product users at a competitive disadvantage.[302] The Committee also notes that when the Treasury Board introduced the government's new cost recovery policy in 1997, departments were required to conduct periodic reviews to ensure user-charge policy requirements

[301] Nephin Consulting Partners, *Pest Management Regulatory Agency Benchmarking Study*, Final Report, July 15, 1998.

[302] Government of Canada, *Government Proposal for the Pest Management Regulatory System*, October 1994.

were being met. Such periodic reviews were also used to address whether fees should be increased or decreased where cost structures had changed, where the mix of public and private benefits had changed, or where service levels had been altered. The Treasury Board was, in turn, required to initiate a review of the government's cost recovery policy within three years of its introduction.[303]

17.17 While the Treasury Board does not appear to have completed its review, the study by the Nephin Consulting Partners was commissioned by Health Canada as part of its obligation under the Treasury Board policy to conduct periodic reviews. Although cost recovery fees were examined in this study, the study did not specifically focus on the impact that the fees might have on the registration of safer and more efficacious products. The discussion in the report was more general in scope.

17.18 In the opinion of the Committee, it is critical that the impact of the cost recovery fees on the registration of safer and more efficacious products be assessed forthwith. If these fees are, in fact, hindering the registration of new and safer pesticides, this would prevent or delay the implementation of one of the fundamental provisions that we propose be codified in the new legislation, namely the substitution principle (discussed in Chapter 11). If cost recovery fees are discouraging the registration of such products, corrective action must be taken as soon as possible.

The Committee recommends that:

(a) the Minister of Health and the Pest Management Regulatory Agency immediately initiate a study to determine whether cost recovery fees constitute a disincentive to the registration in Canada of safer and more efficacious pesticides; and

(b) the Minister of Health table this study in Parliament within six months of the tabling of this report in the House of Commons.

Payment to the Receiver General of Canada

17.19 Because of the concern expressed that the PMRA is giving preference to its revenue-generating activities over the non-revenue-generating ones, the Committee believes that it would be desirable if the applicable fees were paid to the Receiver General of Canada and not directly to the PMRA. If this were done, the PMRA might be under less pressure to generate revenues through the registration of pesticides in order to bolster its operating budget and thus might give a higher priority to the non-revenue-generating activities within its mandate, notably programs directed at developing alternatives to pesticides. Cost recovery fees charged at the federal level paid to the Receiver General is close to 50% of the cases. In the Committee's opinion, it would be beneficial if this approach were also followed with respect to the fees collected by the PMRA.

[303] Treasury Board of Canada Secretariat, *Cost Recovery and Charging Policy*, April 1997.

The Committee recommends that the government take the necessary steps to ensure that the cost recovery fees charged by the Pest Management Regulatory Agency be paid to the Receiver General of Canada and not to the Agency.

The Need for Increased Funding

17.20 Quite apart from the cost recovery issue, it is evident to the Committee that the government's funding of the PMRA is wholly inadequate. When the government agreed to create the Agency in 1994 it indicated in the Purple Book that an additional $20 million, for a total budget of $34 million, would be needed for fiscal year 1997/1998 and beyond to carry out the major activities under the PMRA's mandate. The PMRA informed the Committee that in preparation for the implementation of cost recovery in 1997, it projected an ongoing annual cost of $28.2 million to deliver the program outlined in the government's Purple Book. This figure, however, was reduced to $27 million as a result of discussions with stakeholders. The last budget for the PMRA was projected at $28.3 for fiscal year 1999/2000.[304] This amount, it should be stressed, is almost $6 million less than what the government felt the PMRA needed five years ago.

17.21 As the World Wildlife Fund pointed out, the PMRA is cash-strapped and has had to put many important programs on the back burner. The Commissioner of the Environment and Sustainable Development expressed similar concerns in his 1999 report. He remarked that, within existing budgets, departments were struggling to meet legislated responsibilities, policy commitments and international treaty obligations and, in many cases, were failing do so. He noted the backlog of existing pesticides requiring re-evaluation. He also noted that the number of substances of potential concern continues to grow, particularly in the areas of endocrine disruption and the cumulative effects of exposure to mixtures of toxic substances which might trigger demands for new research and might, ultimately, require that some substances be reassessed. Given this ever-increasing burden, the Commissioner asked, "who would pick up slack?" He stated that the government's reduced funding of the Canadian Network of Toxicology Centres, established to carry out research on behalf of federal departments, threatened the Network's critical mass as well as its ability to attract leveraged funding. He also pointed out that budget reductions had necessitated an emphasis on research partnerships with the private sector and other outside sources. As a result, departmental projects had become more aligned with the priorities of those providing the funds and since the latter's priorities might differ from those established by the department, there was concern about the ability of departments to undertake research for the public good. He concluded:

> We were alarmed by the level of concern among senior scientists in all departments and associated scientific organizations about the government's declining ability to respond to new demands and emerging issues.[305]

[304] Correspondence to the Committee, Pest Management Regulatory Agency, February 14, 2000.

[305] Report of the Commissioner of the Environment and Sustainable Development, Chapter 3, 1999.

17.22 The Committee shares the Commissioner's alarm, and we join the many witnesses who stated that the current state of affairs is unacceptable. Barbara McElgunn of the Learning Disabilities Association of Canada and also a member of the Pest Management Advisory Council, felt that the PMRA should receive the increased budget of $34 million to which the government had committed in the 1994 Purple Book.[306] In the Committee's opinion, an overall budget of $34 million would be a definite step forward. We question, however, whether even this increased sum would be sufficient to do the job. The Committee made a large number of recommendations in this report that go beyond what was contemplated for the PMRA in the Purple Book. We have emphasized the need for more research in a number of key areas. We have called for the creation of various databases. We have stressed the need to focus on alternatives to pesticides. We have also urged the establishment of a comprehensive program to sensitize and educate the public about the risks of pesticides. All of these recommendations will require additional resources.

17.23 The Committee is mindful that requests for increased funding often fall on deaf ears. We wish to stress, however, that the costs of reducing the risks associated with pesticide use in order to protect human health and the environment cover just one side of the ledger. On the other side of the ledger are the costs, typically uncomputed and largely elusive, of doing too little or nothing or of doing it too late. These include the health care costs of treating Canadians suffering from acute or chronic pesticide related diseases or pesticide related disabilities. These include the costs to municipalities of getting rid of pesticides that are contaminating drinking water. These include the cost to the fisheries of foregone revenues occasioned by massive fish kills caused by pesticide contamination. The list goes on.

17.24 In the opinion of the Committee, it is short-sighted and ill-advised to focus strictly or principally on the more immediate economic costs of taking action to prevent or reduce pesticide contamination. Equal weight and consideration must also be given to the mid- and long-term costs of not taking precautionary action. If, as stated in the last Throne Speech, the federal government is serious about protecting "the health of Canadians by strengthening Canada's food safety program, by taking further action on environmental health issues, including the potential health risks presented by pesticides, and by modernizing overall health protection of a changing world,"[307] it must provide the PMRA with the funds needed to do a first class job.

The Committee recommends that the government provide the Pest Management Regulatory Agency with the necessary additional financial resources to effectively carry out its entire program.

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[306] *Evidence*, Meeting No. 4, November 16, 1999.

[307] House of Commons, *Hansard*, No. 1, October 12, 1999.

Active Ingredient (*ingrédient actif*): A substance that is intentionally added to a product that makes the product work as desired.

Acceptable Daily Intake (ADI) (*dose journalière admissible (DJA)*): The daily intake of chemical which, during an entire lifetime, appears to be without appreciable risk on the basis of all known facts at the time. The ADI is obtained by dividing the no observable adverse effect level by a safety factor (e.g.100 or 1000) that is intended to make allowances for possible variability between the animal test species and humans, as well as for inter-individual variations within the human population.

Acute effect (*effet aigu*): An effect in a human or animal, with severe symptoms developing rapidly and coming quickly to a crisis.

Acute exposure (*exposition aiguë*): A single exposure to a substance or multiple exposures occurring within a short time, usually 24 hours or less.

Acute toxicity (*toxicité aiguë*): Toxicity dealing with the adverse effects resulting from a single dose of, or exposure to, a substance.

Administrative Monetary Penalties (AMPS) (*sanctions pécuniaires administratives (SPA)*): AMPs are penalties that are imposed for a violation and that are determined through an administrative process, rather than through prosecution and court hearings.

Adsorption (*adsorption*): The attraction of gases, liquids, or solids to a solid surface.

Aggregate risk (*risque combiné*): Risk from all sources of a pesticide.

Allomone (*allomone*): A semiochemical produced by plants that helps protect them from predatory insects.

Bioaccumulation (*bioaccumulation*): A process whereby substances collect in all, or part of, a living organism.

Biomagnification (*bioamplification*): The process by which the tissue concentration of bioaccumulated chemical residues increases as materials pass up the food chain through two or more trophic levels.

Biopesticide (*biopesticide*): Any biological agent that adversely affects pest species.

Carbamates (*carbamates*): A salt of carbamic acid. An acid with the formula NH2-CO-OH.

Cholinesterase inhibitors (*inhibiteurs de cholinestérase*): Cholinesterase inhibitors inhibit the enzyme cholinesterase thereby allowing the concentration of acetylcholine to increase in the brain.

Chronic effects (*effets chroniques*): An effect on the health of a person or test animal that develops: 1. over time, following a single exposure to a toxic substance; or 2. from prolonged or repeated exposure to a toxic substance under conditions that do not produce that effect from a single exposure.

Chronic exposure (*exposition chronique*): A long-duration, low-level exposure (usually daily or weekly) in which the rate of exposure exceeds the body's capacity for detoxification of the substance.

Chronic toxicity (*toxicité chronique*): An adverse effect caused by repeated or long-term exposure to low doses of a toxic substance.

Concentration (*concentration*): Quantity of a solid, liquid or gas suspended or dissolved in another substance .

Cumulative risk (*risque cumulatif*): Risk posed by chemicals that work in similar ways.

Depressant (*dépresseur*): A drug or chemical that inhibits, slows down or depresses neural activity.

Dermal Toxicity (*toxicité cutanée*): Adverse effects resulting from the skin's exposure to a material. Ordinarily used to denote effects on experimental animals.

Desorption (*désorption*): The process of removing an adsorbed material from the solid on which it is adsorbed (opposite of adsorption).

Developmental Toxicity (*toxicité au développement*): Adverse effects produced by exposure of developing organisms to toxicants during development.

Efficacy (*efficacité*): The ability of a substance to elicit the desired response or result.

Endocrine disrupting substance (*modulateur (perturbateur) endocrinien*): Also referred to as "hormone-disrupting substance" or "environmental estrogens," endocrine disruptors are synthetic chemicals or naturally occurring compounds that can affect the hormone (endocrine) system, which consists of various glands which release hormones that act as chemical messengers. A disrupted endocrine system may lead to health, developmental and reproduction problems in wild and laboratory animals. It is suspected that they may cause similar effects in humans.

Endocrine system (*système endocrinien*): A widely dispersed complex of glands and hormones. The hormones of these glands are secreted directly into the bloodstream and exert their actions on body tissues and functions generally or at remote and specific sites. The complex consisting of the hypothalamus, anterior and posterior pituitary, thyroid, adrenal cortex and gonads.

Environmental Effects Concentration (EEC) (*concentration à effet sur l'environnement (CEE)*): The concentration at which effects are expected to be observed in the environment.

Environmental indicator (*indicateur environnemental*): Selected key statistics which represent or summarize a significant aspect of the state of the environment, natural resource sustainability and related human activities. They focus on trends in environmental changes, stresses causing them, and how the ecosystem and its components are responding to these changes.

Enzyme (*enzyme*): Protein molecule which is able to cause particular chemical reactions to take place and which is manufactured by living organisms for this purpose.

Formulant (*formulant*): Any substance other than the technical active ingredient that is intentionally included in a product.

Fungicide (*fongicide*): A chemical compound that destroys or inhibits the growth of fungi.

Half-life (*demi-vie*): The period of time for a chemical substance to lose half its concentration or activity due to metabolic uptake, decay or other chemical change. Certain substances (such as PCBs) persist for a long time in the environment (half-life of more than 2 years).

Herbicide (*herbicide*): A chemical used to control, suppress, or kill plants or severely interrupt their normal growth processes.

Immune system (*système immunitaire*): The body's defence system that protects against foreign invading substances or organisms (e.g. micro-organisms).

Immunotoxicity (*immunotoxicité*): Adverse effects on the immune system and toxic effects that are mediated by the immune system.

Insecticide (*insecticide*): A substance or mixture of substances intended to prevent, destroy, repel or mitigate insects.

Integrated pest management (IPM) (*lutte intégrée*) (LI): An approach to pest control that strives to manage pests at acceptable levels instead of completely eliminating them. It begins with techniques that are least disruptive, such as planting resistant varieties, using biological controls, less toxic sprays and appropriate cultural techniques, and only using synthetic pesticides as a last resort.

Kairomone (*kairomone*): Communication chemical that benefits the receiver and is disadvantageous to the producer.

Margin of safety (*marge de sécurité*): A numerical estimate of the ratio between the expected dose and the toxic dose.

Maximum Residue Limit (MRL) (*limite maximale des résidus (LMR)*): The amount of a pesticide which has been determined may safely remain in, or on, the food crop without hazard to the ultimate consumer.

Median Effect Concentration (EC_{50}) (*concentration efficace moyenne (CE_{50})*): The concentration of a chemical that produces a response in 50% of the test population over a specific period of time.

Median Lethal Dose (LD_{50}) (*dose létale 50 (DL_{50})*): The dose required to result in 50% mortality within a population.

Metabolism (*métabolisme*): The overall biochemical reactions that take place in a living organism. It includes the building of more complex molecules (anabolism) and the breakdown of molecules to provide energy (catabolism).

Metabolite (*métabolite*): An intermediate material produced and used in the processes of a living cell or organism; a product of metabolism.

Neurotoxic (*neurotoxicité*): Having a adverse effect on the nervous system.

NOAEL (No Observable Adverse Effect Level) (*concentration sans effets toxiques observée (CSENO)*): The highest dosage administered that does not produce detectable adverse effects.

Organic farming (*agriculture biologique*): Production of a natural commodity without synthetic chemicals or a process that uses living organisms.

Organochlorine (*organochloré*): A compound in which an atom of chlorine is bound to a molecule that contains carbon and hydrogen.

Organophosphate (*organophosphate*): A compound in which an atom of phosphorus is bound to a molecule that contains carbon and hydrogen atoms.

Parasitoid (*parasitoïde*): An organism which lives at the expense of the host and kills it when it is an adult. The term "parasitoid," which is becoming more and more common, includes all arthropods which develop to the detriment of crop pests, regardless of their mode of action.

Persistent (*persistant*): Chemically stable, long-lived in soil and aquatic environments and in animal and plant tissues.

Persistent Organic Pollutant (POP) (*polluant organique persistant (POP)*): Set of organic compounds that: (i) possess toxic characteristics; (ii) are persistent; (iii) are liable to bioaccumulate; (iv) are prone to long-range atmospheric transport and deposition; and (v) can result in adverse environmental and human health effects at great distances from their source.

Pesticide (*pesticide*): Any substance or mixture of substances intended for killing or controlling insects, rodents, fungi, weeds, and other forms of plant or animal life that are considered to be pests.

Photodegradation (*photodégradation*): The process of the breakdown of complex, large organic molecules into small, simple molecules by light energy.

Pyrethroids (*pyréthroïdes*): The synthetic substances that are derivatives of naturally occurring pyrethrins are called pyrethroids. Pyrethroids include compounds such as permethrin, chlormethrin, bromethrin and fenvalerate.

Reproductive Toxicity (*toxicité pour la reproduction*): The adverse effect of a substance on the capability of an organism to produce offspring.

Safety factor (*facteur de sécurité*): The factor is intended to account for the uncertainties inherent in estimating effects of a chemical on humans from results obtained on test animals. The safety factor allows for possible differences in sensitivity between the test animal and humans, between average humans as well as for variations in the sensitivity of individuals within the human population.

Systemic (*systémique*): Substance that is absorbed by, and flows through, the entire system of a plant or animal. Systemic or translocated pesticides can be applied to the soil as granules and will move through the plant roots to control insects, weeds or fungi.

Toxicokinetics (*toxicocinétique*): Quantification and determination of the time course of absorption, distribution, biotransformation and excretion of chemicals by the body.

Transgenic (*transgénique*): An organism whose genome has been modified by the introduction of one or more genes from another species and which therefore shows a new characteristic at the individual level.

2. THE NEED FOR NEW LEGISLATION

An Outdated Legislation

The Committee recommends that the Minister of Health introduce new pesticide legislation as a matter of top priority.

Guiding Principles for the New Legislation

The Committee recommends that the new Act be based on the following principles:

- to protect human health and the environment as the absolute priority in all pest management decisions;
- to apply the precautionary principle;
- to promote and increase reliance on pollution prevention strategies in order to eliminate or minimize the use of pesticides; and
- to foster public confidence by actively informing and educating Canadians about pesticide use and by involving them in the decision-making process.

The Committee recommends that these principles be enshrined in the new Act's preamble and its operative sections, notably, in an administrative clause similar to section 2 of the *Canadian Environmental Protection Act, 1999*.

The Committee recommends that the precautionary principle be defined as follows in the new Act:

> The precautionary principle means that appropriate preventive measures are to be taken where there is reason to believe that a pesticide is likely to cause harm, even when there is no conclusive evidence to prove a causal relation between the pesticide and its effects.

The Committee recommends that the *Pest Control Products Act* be renamed the Pest Control Act.

4. PESTICIDES IN THE ENVIRONMENT

Environmental Research Programs

The Committee urges the federal government to substantially increase funding for research on and monitoring of the effects of pesticides in the environment, in order to protect human health and the environment.

5. THE POTENTIAL EFFECTS OF PESTICIDES ON HEALTH

The Effects of Phenoxy Herbicides and Pyrethroids

The Committee recommends that the government fund research on those chemical groups of pesticides whose action and chronic effects on human health are still relatively unknown, such as synthetic pyrethroids and phenoxy herbicides.

Research on Endocrine Disruptors

The Committee recommends that the government strengthen its research programs on endocrine disruptors, particularly by providing adequate, permanent funding for: (1) carrying out research on wildlife and (2) developing a specific protocol for detecting the effects of endocrine disruptors on human health.

6. VULNERABILITY OF CHILDREN

Research into Child Vulnerabiltiy

The Committee recommends that the government immediately develop and ensure adequate funding for pesticides research program devoted specifically to child health. Research goals should focus on the exposure of the fetus and the newborn to pollutants accumulated in the mother's body and on the neurotoxic effects of pesticides and on such aspects as children's daily activities and their developmental and physiological characteristics.

7. OTHER VULNERABLE POPULATION GROUPS

Research on Protecting Vulnerable Groups

The Committee recommends that Health Canada take the necessary steps to bring about legal recognition of multiple chemical sensitivity syndrome.

The Committee recommends that the government fund Health Canada and its government partners so that they can assess the relevance of existing research protocols involving vulnerable population groups, draft new protocols where necessary and pursue current research on the impact of pesticides on human health, particularly on vulnerable groups.

The Committee recommends that the new Pest Control Act give priority to protection of the environment and human health, and especially to the protection of all vulnerable population groups.

The Committee recommends that the government ensure legal protection, through the new Pest Control Act, for the most vulnerable groups: fetuses, children, seniors, women, Aboriginal people, persons suffering from multiple chemical sensitivity or in poor health, and professional users of pesticides. To this end, decisions on pesticides should be based on the protection of the most vulnerable groups.

8. RISK AND VALUE ASSESSMENTS

Risk Assessment

The Committee recommends that the data quality and integrity systems that would be accepted as equivalent to the Organization for Economic Co-operation and Development's good laboratory practices program be clearly defined as a Pest Management Regulatory Agency Regulatory Directive.

Human Health

The Committee recommends that all risk assessment and risk management processes which the Pest Management Regulatory Agency uses be clearly defined and published.

The Committee recommends that the Pest Management Regulatory Agency add tests for neurotoxicity and, when available, for endocrine disruption to the lists of toxicology studies that are mandatory for all pesticides.

The Committee recommends that the Pest Management Regulatory Agency work with the Organization for Economic Co-operation and Development and the United States Environmental Protection Agency to amend protocols to investigate pesticide effects on fetal development and children, including neurological development.

Human Health Risk Assessment

The Committee recommends that:

(a) Health Canada continue research into the adequacy of an additional factor of 10 at protecting children's health;

(b) at least one additional safety factor of 10 be used in determining the tolerance of pesticide residues in food stuffs in order to protect the health of vulnerable sectors of the population including children and fetuses;

(c) acceptable margins of safety used when conducting non-dietary assessments should be increased by at least one factor of 10 from 100 to 1000; and

(d) the use of this additional safety factor should be given a legislative basis in the new Pest Control Act.

The Committee recommends that the Pest Management Regulatory Agency incorporate cumulative and aggregate risks and the possible interaction between pesticides into their evaluation and, more specifically, in the determination of maximum residue limits and that cumulative and aggregate risks be defined in the new Pest Control Act.

Environmental Risk Assessment

The Committee recommends that the Pest Management Regulatory Agency's environmental safety evaluations include more comprehensive and in-depth studies on the impacts of pesticide use on the environment (e.g. water, air, soil, sediment, and non-target organisms).

The Committee recommends the re-establishment of a direct mechanism for submission of independent scientific findings to the PMRA. This type of submission would be followed by mandatory feedback from the Agency to the individual or group who submitted the information.

The Committee recommends that the Pest Management Regulatory Agency continue to require a full set of efficacy data for the registration of pesticides.

Additional Risk Assessment Practices

The Committee recommends that formulants be subject to the same assessment, review and access to information provisions as the "active ingredient," including the requirement that they be listed on the pesticide label. Contaminants, including microcontaminants, should be reviewed thoroughly and all toxicity information should be available to the public. These new aspects of the safety assessments should be incorporated into the new Pest Control Act.

New Pesticide Applications

The Committee recommends, given the lack of long-term data on pesticide use on genetically modified plants, that the new Pest Control Act specify that the use of a pesticide on a genetically modified plant require an amendment to the pesticide's registration. The amendment process should necessitate an assessment of the use of that pesticide on the genetically modified plant.

Burden of Proof

The Committee recommends that the burden of proof that a pesticide does not pose an unacceptable risk remain with the manufacturer both before and after registration.

9. RISK MANAGEMENT

Refusal to Register

The Committee recommends that children's health be the focus and indicator of what constitutes 'unacceptable risk' for the regulation of pesticides.

The Committee recommends that the Pest Management Regulatory Agency ensure that its implementation document is consistent with the federal Toxic Substances Management Policy by, among other things, using the exact terms found in this policy.

The Committee recommends that pesticides containing any Track 1 substance under the federal Toxic Substances Management Policy not be registered or re-registered.

The Committee recommends that the Pest Management Regulatory Agency establish science-based inherent toxicity criteria, such as thresholds for endocrine disruption, neurotoxicity, and carcinogenicity so that pesticides meeting any of these thresholds not be registered or, if already on the market, be de-registered.

Restrictions on the Use of Pesticides

The Committee recommends that the Pest Management Regulatory Agency improve its inspection and enforcement operations and, in the case of non-compliance, apply the full range of available enforcement penalties.

The Committee recommends that the Pest Management Regulatory Agency work with the provinces and territories to investigate the use of pesticides to determine whether users comply with label instructions.

Cancellation or Suspension of Registration

The Committee recommends that, as a condition of registration for all pesticides, the new Pest Control Act require registrants to conduct routine post-registration monitoring, to report all adverse effects to the Pest Management Regulatory Agency, and to co-ordinate with government departments and industry associations to avoid unnecessary overlap and duplication.

The Committee recommends that the Pest Management Regulatory Agency establish a database of all reported adverse effects of pesticides and that the information from this database be used in future risk assessments.

10. RE-EVALUATION OF PESTICIDES AND SPECIAL REVIEWS

Re-evaluation

The Committee recommends that the re-evaluation program be adequately funded so that all pesticides registered prior to 1995 be re-evaluated no later than 2006.

Special Reviews

The Committee recommends that the new Pest Control Act contain provisions for special review of pesticide registrations, and that when a member country of the Organization for Economic Co-operation and Development (OECD) bans a pesticide for safety reasons such a review be mandatory.

The Committee recommends that the new Pest Control Act specify that, in the event that a pesticide has gone 15 years without being assessed, either through registration or special review, a re-evaluation by the Pest Management Regulatory Agency be required within one year.

11. ALTERNATIVES TO PESTICIDES

Integrated Pest Management Research and Strategies

The Committee recommends that the Pest Management Regulatory Agency, in conjunction with other relevant departments and educational institutions, favour a reduction of pesticide use, develop alternatives to pesticides and promote integrated pest management by:

(a) developing a pesticide use reduction policy and implementing it in all its activities, including the registration process; and

(b) revising its integrated pest management program.

The Committee recommends that the government allocate appropriate funding year after year to permit full implementation of the Agency's integrated pest management program.

The Committee recommends that, to protect the environment and human health:

(a) the government allocate appropriate financial resources to integrated pest management research and public information and, in particular;

(b) Agriculture and Agri-Food Canada increase research into alternatives to pesticides and formulate pest management strategies.

The Committee recommends that the government, in co-operation with its provincial and territorial partners, establish a national alternatives-to-pesticides data base and that it be made available to the public through an electronic registry.

The Committee recommends that the substitution principle included in Sweden's new Environmental Code be defined in the new Pest Control Act and that the Pest Management Regulatory Agency apply the substitution principle in order to promote the replacement of pesticides with less toxic products and non-chemical measures.

Tax Incentives for Organic Agriculture

The Committee recommends that the government develop an organic agriculture policy for the transition from pesticide-dependent farming to organic farming. This policy should include tax incentives, an interim support program during the transition period, technical support for farmers, the development of post-secondary organic farming programs and enhanced funding for research and development (R&D) in organic agriculture.

Food Grading System

The Committee recommends that the government work with industry to quickly put in place a certification organization for the *Canadian National Organic Agriculture Standard.*

The Committee recommends that the food labelling system be improved to provide consumers with better information on the intrinsic nutritional qualities of food products.

Organic Agriculture Research

The Committee recommends that the government grant appropriate financial resources for research, teaching and information distribution in the organic agriculture sector.

The Committee recommends that the government create research chairs in organic agriculture.

The Committee recommends that, within six months of the tabling of the government response to the present report, a special committee composed of members of the Standing Committees on Environment and Sustainable Development, Agriculture and Agri-Food, and Foreign Affairs and

International Trade, be formed to conduct an in-depth study on organic agriculture in the domestic and the international context and to make recommendations to the government.

12. URGENT NEED FOR ACTION: AWARENESS, REDUCTION, PHASE OUT

The Importance of an Awareness Campaign

The Committee recommends that the government introduce a comprehensive national awareness and information campaign on pesticides.

Pesticide Reduction at the Federal Level

The Committee recommends that the government, including departments, federal councils and agencies, Crown corporations listed in Schedule III of the *Financial Administration Act*, federal regulatory agencies, and federal lands, pursuant to the new Pest Control Act legislation:

(a) report to Parliament on all its uses of pesticides, through the sustainable development strategies, indicating the type and amount of pesticides used, when and where; and

(b) establish pesticide use reduction plans.

The Committee recommends that the federal government develop and adopt, with the assistance of its provincial and territorial partners and with the private sector, a national pesticide reduction protocol similar to what has been done in Europe and modelled on the National Packaging Protocol developed by the Canadian Council of Ministers of the Environment.

Gradual Reduction in the Use of Pesticides for Esthetic Purposes

The Committee recommends that the new Pest Control Act prohibit the registration and re-registration of pesticides intended for cosmetic uses.

The Committee urges the government, in partnership with the provinces, territories and municipalities, to develop a strategy for the gradual phase-out of pesticides used for cosmetic purposes.

13. INFORMING AND INVOLVING THE CANADIAN PUBLIC

The Disclosure of Information

The Committee recommends that, as a condition of registration, the new Pest Control Act require that any pesticide containing a toxic formulant, contaminant or microcontaminant which is toxic within the meaning of section 64 of the *Canadian Environmental Protection Act, 1999*, bear a warning on its label that it contains a toxic ingredient, the amount and name of which must be identified on the label.

The Committee recommends that the new Pest Control Act contain measures which would allow the broadest possible disclosure of information to the public. At a minimum, these measures should be similar to the disclosure provisions set out in sections 51 to 53 of the *Canadian Environmental*

Protection Act, 1999, and should be supplemented by a non-exhaustive list of information that would have to be disclosed publicly. In particular:

(a) the new Pest Control Act should provide for the public disclosure of all information provided to the Pest Management Regulatory Agency in relation to pesticides;

(b) a request for confidentiality may be made in writing but it should be sustained only in relation to confidential business information, subject to an overriding discretion to disclose confidential business information where the public interest outweighs the financial or competitive interests of the person requesting confidentiality;

(c) the term "confidential business information" should be defined narrowly to encompass only information that would be truly prejudicial to the financial or competitive interests of the person to whom it belongs; and

(d) a non-exhaustive list should be provided of information that would have to be disclosed to the public, even though the information might otherwise qualify as confidential business information. Without limiting the generality of the foregoing, such a list should specifically include:

- information respecting the ingredients of pesticides, including formulants, contaminants and by-products;

- all information concerning the objectives, methodology, results or significance of any test or experiment performed on or with a registered or previously registered pesticide or its separate ingredients, impurities, or degradation products;

  (1) any information concerning the effects of such pesticide on any organism,

  (2) the behaviour of such pesticide in the environment, and

  (3) including, but not limited data on safety to humans, animals, plants and soil;

- studies on persistence, translocation and fate in the environment, and metabolism.

An Electronic Public Registry of Information

The Committee recommends that the new Pest Control Act require the establishment of an electronic public registry.

The Committee, subject to the narrow exemption recommended in this report for confidential business information and such restrictions on access to information as are imposed under binding international agreements, recommends that the registry contain as much information as possible, including:

- the registration, special review and re-evaluation of pest control product documents, including related test data, conditions of registration, validity period for all registered products, reports of evaluations of risks and value, and maximum residue limits;

- the cancellation or suspension of registration certificates;

- notices of objection and related disposition of the cases;
- export, research, own-use import and other permits;
- enforcement action and related disposition of the cases;
- the adverse effects database, the alternatives to pesticides database and the pesticide sales and use database;
- advisory body reports;
- interdepartmental memoranda of understanding;
- international harmonization activities; and
- proposed and final texts of regulations, policies, guidelines and codes of practice.

Annual Report to Parliament

The Committee recommends that the Minister of Health be required to table in Parliament an annual report on the administration and enforcement of the new Pest Control Act.

Participation in the Decision-Making Process

The Committee recommends that:

(a) the new Pest Control Act require that notice be given in relation to all proposed registration decisions, special reviews, re-evaluations, major registration changes, regulations, policies, memoranda of understanding, agreements, guidelines and codes of practice and that the public be afforded a reasonable opportunity to comment;

(b) the new Pest Control Act require that the comments received be considered before a decision is taken and that a summary outlining how the comments were taken into consideration be provided with the decision;

(c) the new Pest Control Act allow any party to file a notice of objection concerning major decisions taken under the Pest Control Act, including decisions respecting registrations, re-evaluations, special reviews and certificate amendments and the Minister be given the authority to determine whether or not a review panel should be established based on criteria set out in the legislation.

Pesticide Sales and Use Inventories

The Committee recommends that:

(a) as a condition of product registration, the new Pest Control Act require registrants to provide the Pest Management Regulatory Agency with their sales data on an ongoing basis which, at a minimum, must identify the product and amount sold, as well as the location and date of sale; and

(b) the pesticide sales inventory be made public on the electronic public registry of information.

The Committee recommends that:

(a) the new Pest Control Act require the establishment of a national pesticide use inventory to track the use of designated pesticides, beginning with the pesticides of greatest concern;

(b) the Pest Management Advisory Council be charged with the selection of the pesticides subject to mandatory reporting under this inventory; and

(c) the pesticide use inventory be made public on the electronic public registry of information.

Whistleblower Protection

The Committee recommends:

(a) that whistleblower protection be provided under the new Pest Control Act. In particular, the new Pest Control Act should make it an offence for anyone to disclose the identity of any person, including an employee, who voluntarily reports an offence that has been committed or that is likely to be committed under the new Pest Control Act unless that person waives anonymity;

(b) that it be an offence under the new Pest Control Act for anyone to take any kind of retaliatory action against, or to otherwise disadvantage, any person who, acting in good faith and on the basis of reasonable belief, voluntarily reports an offence that has been committed or that is likely to be committed under the new Pest Control Act, or refuses or expresses an intention to refuse to do anything that would constitute an offence under the new Pest Control Act; and

(c) that it be an offence under the new Pest Control Act for an employer to dismiss, suspend, demote, discipline, harass, impede in advancement, or otherwise disadvantage an employee who, acting in good faith and on the basis of reasonable belief, voluntarily reports an offence that has been committed or that is likely to be committed under the new Pest Control Act, or refuses or expresses an intention to refuse to do anything that would constitute an offence under the new Pest Control Act.

14. THE SPECIAL INFORMATION NEEDS OF WORKERS AND HEALTH CARE PROFESSIONALS

The Workers' Right to Know

The Committee recommends that the current exemption of pesticides from the Workplace Hazardous Material Information System (WHMIS) be removed and that pesticides be required to meet all the WHMIS requirements, subject to such modifications as are needed to account for the differences between pesticides and other types of hazardous substances.

Health Care Professionals

The Committee recommends that the Minister of Health, solely or jointly with the provincial and territorial Ministers of Health, establish an effective twenty-four hour medical emergency information service with respect to pesticides and other toxic substances.

The Committee recommends that the Minister of Health, in partnership with the provincial/territorial Ministers of Health, the governing bodies for medical practitioners and the national/provincial/territorial medical associations:

(a) ensure that health care professionals are given the necessary education and training to identify and treat illnesses caused by, or involving exposure to, pesticides and other toxic substances; and

(b) encourage health care professionals to report cases of adverse effects to the Pest Management Regulatory Agency for inclusion in the adverse effects database recommended by the Committee.

15. INSTITUTIONAL CHANGES

A Statutory Base for the PMRA

The Committee recommends that a statutory base be provided to the Pest Management Regulatory Agency in the new Pest Control Act and that its role and responsibilities be clearly defined.

A Strengthened Mandate for the PMRA

The Committee recommends that the Pest Management Regulatory Agency be given the following priorities in its mandate under the new Pest Control Act:

(a) give absolute priority to the protection of human health and the environment when considering whether to approve a pesticide for use in Canada or allow its continued use;

(b) promote the use of sustainable pest management strategies that seek to reduce use, risk and reliance on pesticides;

(c) emphasize the development of safer pest control products; and

(d) inform and educate the public about pesticides and the risks associated with their use.

The Advisory Bodies

The Committee recommends a restructuring of the advisory bodies, specifically that:

(a) the Economic Management Advisory Committee be dissolved and its functions be taken over by the Pest Management Advisory Council;

(b) the Federal/Provincial/Territorial Committee on Pest Management and Pesticides and the Pest Management Advisory Council be officially recognized in the new Pest Control Act and their mandates be defined;

(c) the mandate of the Pest Management Advisory Council explicitly provide that absolute priority be given to the protection of human health and the environment; and

(d) the broad-based membership of the Pest Management Advisory Council be explicitly retained in the new Pest Control Act.

Improved Information Sharing

The Committee recommends that:

(a) the new Pest Control Act expressly authorize the disclosure by the Pest Management Regulatory Agency of confidential information, including confidential business information, to other federal, provincial and territorial departments and agencies that require the information in the course of their duties, subject to their maintaining the confidentiality of the information;

(b) as an interim measure, the Pest Management Regulatory Agency develop forthwith the broadest possible policy permitted at common law on the disclosure of confidential information, including confidential business information, to other federal, provincial and territorial departments and agencies that require the information in the course of their duties, subject to their maintaining the confidentiality of the information; and

(c) the Minister of Health ensure that the Pest Management Regulatory Agency implements such a policy no later than 60 days from the tabling of this report in the House of Commons.

Inter-Departmental Memoranda of Understanding

The Committee, deploring the use of memoranda of understanding unless they are developed through a clear and transparent process, recommends that:

(a) before being finalized and signed, all inter-departmental memoranda of understanding negotiated by the Pest Management Regulatory Agency and other departments in relation to pest management issues be published on the electronic public registry and that the public be afforded a thirty-day period for comments;

(b) these memoranda of understanding be revised to ensure that they contain an effective review mechanism; and

(c) the relevant Ministers take full responsibility by approving and signing the agreements.

The Committee recommends that in the event of a disagreement between federal agencies and departments regarding the use of a pesticide, the new Pest Control Act explicitly require the application of the precautionary principle to give priority to the protection of human health and the environment.

The Committee, reiterating the concerns expressed by the Commissioner of the Environment and Sustainable Development regarding the failure of the Pest Management Regulatory Agency and Fisheries and Oceans Canada to resolve their differences and take co-operative action, recommends that the Pest Management Regulatory Agency and Fisheries and Oceans Canada proceed forthwith to conclude a Memorandum of Understanding in relation to pest management issues in fisheries and

aquaculture and that the agreement negotiated by them be approved and signed by their respective Minister.

The Committee recommends that the Pest Management Regulatory Agency and the sectoral departments take immediate steps to implement the provisions of their respective Memoranda of Understanding.

16. INTERNATIONAL HARMONIZATION

The Committee recommends that a clause be added in the operative sections of the new Pest Control Act requiring that protection of human health and the environment according to the precautionary principle be the sole objective of any action to harmonize Canadian standards with those of other countries, and that such standards not be weakened in any way.

The Committee recommends that the harmonization process be fully transparent by requiring that all harmonization negotiations and actions be reported on the Pest Management Regulatory Agency's electronic public registry of information.

17. THE FUNDING DILEMMA

The Need to Review the Cost Recovery Program

The Committee recommends that:

(a) the Minister of Health and the Pest Management Regulatory Agency immediately initiate a study to determine whether cost recovery fees constitute a disincentive to the registration in Canada of safer and more efficacious pesticides; and

(b) the Minister of Health table this study in Parliament within six months of the tabling of this report in the House of Commons.

Payment to the Receiver General of Canada

The Committee recommends that the government take the necessary steps to ensure that the cost recovery fees charged by the Pest Management Regulatory Agency be paid to the Receiver General of Canada and not to the Agency.

The Need for Increased Funding

The Committee recommends that the government provide the Pest Management Regulatory Agency with the necessary additional financial resources to effectively carry out its entire program.

APPENDIX A

LIST OF WITNESSES

Associations and Individuals	Date	Meeting
1st Session		
Health Canada	Tuesday, June 1, 1999	126
Steve Clarkson, Acting Director, Bureau of Chemical Hazards, Environmental Health Directorate		
Rod Raphael, Acting Director General Environmental Health Directorate Health Protection Branch		
Pest Management Regulatory Agency		
Claire Franklin, Executive Director		
Charalyn Kriz, Director, Environmental Assessment Division		
John Smith, Senior Project Manager, Alternative Strategies and Regulatory Affairs Division		
Environment Canada	Wednesday, June 2, 1999	127
David Brackett, Director General Canadian Wildlife Service		
Vic Shantora, Director General, Toxics Pollution Prevention Directorate		
Fisheries and Oceans Canada		
Ronald C. Pierce, Director, Environmental Science Branch, Habitat Management and Environmental Science Directorate		
Gerry Swanson, Acting Assistant Deputy Minister, Oceans		
Natural Resources Canada		
Richard Arseneault, Director, Office of Environmental Affairs		
Errol Caldwell, Director, Integrated Pest Management		
Carl Winget, Acting Director General, Science Branch, Canadian Forest Service		

Associations and Individuals	Date	Meeting
Agriculture and Agri–Food Canada Bill Boddis, Acting Director, Cross Sectoral Policy Development Division, Policy Branch Frank Marks, Director, Southern Crop Protection and Food Research Centre, London, Ontario Terence McRae, Senior Environmental Analyst Environment Bureau Michael Presley, Director, Environment Bureau Policy Branch	Tuesday, June 8, 1999	128
Canadian Food Inspection Agency André Gravel, Vice-President, Programs Margaret Kenny, Acting Director Office of Biotechnology		
Stop the Spraying Mary Doody Jones	Thursday, June 10, 1999	129
World Wildlife Fund Julia Langer, Director, Toxicology Program		

2nd Session

Canadian Food Inspection Agency Peter Brackenridge, Executive Director Plant Products Directorate	Tuesday, November 2, 1999	2
Health Canada Joe Losos, Assistant Deputy Minister Health Protection Branch Rod Raphael, Acting Director General, Environmental Health Directorate, Health Protection Branch		
Pest Management Regulatory Agency Claire Franklin, Executive Director Wendy Sexsmith, Director, Alternative Strategies and Regulatory Affairs		
Campaign for Pesticide Reduction Peggy Land, Co-Chair	Thursday, November 4, 1999	3

Associations and Individuals	Date	Meeting
Ottawa-Carleton — Working Group on Health Dangers on the Urban Use of Pesticides Melissa McDonald, Member John Sankey, Former Co-Chair	Thursday, November 4, 1999	3
Canadian Institute of Child Health Sandra Schwartz, Director, Environmental Programs	Tuesday, November 16, 1999	4
Canadian Public Health Association Nicole Bruinsma, Member		
Learning Disabilities Association of Canada Barbara McElgunn, Health Liaison Officer		
Canadian Environment Defence Fund Burkhard Mausberg, Executive Director	Wednesday, November 17, 1999	5
Sierra Club of Canada Angela Rickman, Deputy Director		
World Wildlife Fund Julia Langer, Director, Toxicology Program	Wednesday, November 17, 1999	5
World Wildlife Fund (United States) Theo Colborn, Senior Fellow		
Pest Management Advisory Council John Jarrell, Vice-Chair Richard Van Loon, Chair	Thursday, November 18, 1999	6
Canadian Labour Congress David Bennett, National Director Health, Safety and Environment Hassan Yussuff, Executive Vice-President	Tuesday, November 23, 1999	7
Canadian Water and Wastewater Association Ian Douglas, Chair, Water Committee T. Duncan Ellison, Executive Director André Proulx, Director		
Health Canada Véronique Morisset, Evaluator, Water Quality Microbiology and Cosmetics Division Barry Thomas, Senior Scientific Advisor Bureau of Chemical Hazards		

Associations and Individuals	Date	Meeting
Canadian Manufacturers of Chemical Specialties Association Shannon Coombs, Director, Government Relations Peter McLeod, Chair, Joint Pesticide Standing Committee	Wednesday, November 24, 1999	8
Urban Pest Management Council of Canada Wendy Rose, Vice-President and Executive Director		
AGCare (Toronto) Jeff Wilson, Executive Member	Thursday, November 25, 1999	9
Canadian Federation of Agriculture Bob Friesen, President		
Canadian Horticultural Council Ron Cameron, Chairman, Crop Protection Committee		
Crop Protection Institute Denise Dewar, Manager, Scientific Affairs Lorne Hepworth, President Charles D. Milne, Vice-President Government Affairs		
Action Chelsea for the Respect of the Environment Andrea Lockwood, Coordinator Noha Fuad, Coodinator	Tuesday, November 30, 1999	10
Citizens for Alternatives to Pesticides Merryl Hammond, Founder		
Federation of Canadian Municipalities Brian Detzler, Team Leader, Programming for Recreation and Leisure Services, City of Waterloo		
Municipality of Chelsea, Quebec Judy Grant, Mayor		
"Nature-Action Québec" Edith Smeesters, President		

Associations and Individuals	Date	Meeting
Canadian Association of Physicians for the Environment Kelly Martin, Member of the Board of Directors	Wednesday, December 1, 1999	11
Canadian Environmental Law Association Kathy Cooper, Researcher Paul Muldoon, Executive Director		
Ontario College of Family Physicians Peter Sakuls, Member Loren Vanderlinden, Researcher	Wednesday, December 1, 1999	11
Agriculture and Agri-Food Canada R.E. (Bob) Blackshaw, Research Scientist Weed Management, Lethbridge Research Center Bernard D. Hill, Environmental Chemist Lethbridge Research Center	Thursday, December 2, 1999	12
Environment Canada Pierre Mineau, Researcher and Section Head Pesticides, Canadian Wildlife Service		
Canadian Organic Advisory Board Allen Graff, President	Tuesday, December 7, 1999	13
Canadian Organic Growers Eleanor Heise, President		
Laval University Jeremy McNeil, Professor of Biology		
University of Guelph Peter Stonehouse, Research Officer, Department of Agricultural Economics and Business		
Government of Prince Edward Island Bill Drost, Deputy Minister, Department of Technology and Environment Clair Murphy, Director of Water Resources Ken Rubin, Public Interest Researcher and Access to Information Expert	Wednesday, December 8, 1999	14
Office of the Auditor General of Canada Brian Emmett, Commissioner of the Environment and Sustainable Development John Reed, Principal, Audit Operations	Monday, December 13, 1999	15

Associations and Individuals	Date	Meeting
As Individuals Rod MacRae Wayne Roberts Lori Stahlbrand	Monday, December 13, 1999	15
Cantox Inc. Earle Nestmann, Principal	Tuesday, December 14, 1999	16
Indian and Northern Affairs Canada James R. Moore, Assistant Deputy Minister Northern Affairs Program David Stone, Director, Northern Science and Contaminants Research Division		
International Institute of Concern for Public Health Rosalie Bertell, President		
Inuit Circumpolar Conference Terry Fenge, Research Director Stephanie Meakin, Technical Advisor		
Health Canada Rod Raphael, Acting Director General Environmental Health Directorate Health Protection Branch Hon. Allan Rock, Minister	Thursday, February 17, 2000	23
Pest Management Regulatory Agency Claire Franklin, Executive Director		

APPENDIX B

ADDITIONAL BRIEFS

Canadian Society for Environmental Medecine

John Molot, President

City of Westmount, Québec

Maureen Lafrenière, Environmental Coordinator

Laval University

Marie Coyea, Faculty of Forestry and Geomatic

Nunavut Tunngavik Incorporated

James Eetoolook, Acting President

Physicians and Scientists for a Healthy World Inc.

Libuse Anna Gilka

Real Alternatives to Toxins in the Environment

Maureen Reynolds, Director

Working Group on Women and Health Protection

Barbara Mains, Member

As Individuals

Ellen Francis

Jim and Barbara Hollingworth

Jean-Dominique Levesque-René

REQUEST FOR GOVERNMENT RESPONSE

Pursuant to Standing Order 109, the Committee requests that the government table a comprehensive response to this Report within one hundred and fifty (150) days.

A copy of the relevant Minutes of Proceedings of the Standing Committee on Environment and Sustainable Development (*Meetings Nos. 126, 127, 128 and 129 of the First Session, Thirty-Sixth Parliament, and Meetings Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 of the present Session, which includes this Report*) is tabled.

Respectfully submitted,

The Hon. Charles Caccia, P.C., M.P.
Davenport

Chair

OFFICIAL OPPOSITION REPORT ON PESTICIDES

I. INTRODUCTION

In developing this Minority Report, the Official Opposition has reflected on the May 1999 report of the Commissioner of the Environment and Sustainable Development which dealt with a number of issues relating to identifying, managing, and reducing pesticide risks. We have also considered the submissions of the many stakeholders who have appeared before the Committee. Although Canada's risk management strategies are among the most advanced in the western world, all stakeholders recognize there is room for improving the transparency, efficiency and accountability in our pesticides management system. Many of these stakeholders have provided the Committee with excellent recommendations for achieving these important goals. The Official Opposition's objectives within this Minority Report are to promote a balanced approach toward dealing with issues relating to the management and regulation of pest control products, and within this, to offer recommendations for how the **Pest Management Regulatory Agency (PMRA)** can improve on fulfilling its mandate to protect human health and the environment.

Weighing the Necessity and Value of Pesticides: What Good Do They Do?

Before we can properly evaluate the effectiveness of pest control products, or a regulatory body such as the PMRA that oversees the registration and use of such products, we ought to first consider their necessity. Is there a need for such products – whether chemically or biotechnologically based – to exist in the first place? In answering this question, it is important to first understand the pest management challenges facing growers and property owners. It is also essential to understand the rigorous science behind pest control product development; in particular the methods and practices employed to make health and safety the first priority in determining how pest control products should be used.

In fact, pest control products and technologies confer many important benefits to Canadians growers and homeowners. Crop protection products prevent crops and lands from being ravaged by insect or fungi infestations, thus minimizing the risk of related and disease or damage, and allowing essential food groups to be harvested for consumption in Canada or for export abroad. In so doing, these products help to keep one of Canada's largest export sectors competitive internationally. Pest control products also increase the esthetic value of lands, whether on an individual's private property or a public golf course, by keeping vegetation and turf vibrant and healthy. For a majority of Canadians, pest control products have become a necessary part of life.

The Committee Report Lacks Balance

Regrettably, the Report lacks balance and does very little to promote partnership and understanding between stakeholders. The Report also fails to recognize the tremendous efforts and successes achieved by manufacturers and users of pest control products to make those products as safe to human health and the environment, as they are effective in controlling pests and protecting crops. The Report also strayed from its mandate to examine the performance of the PMRA. The Environment

Commissioner's criticisms of the PMRA included concern over inefficiencies in its regulatory operations: timeline delays within re-evaluation activities, a lack of information sharing, and lack of co-operation with industry.

II. THE PMRA AND RISK MANAGEMENT

The Precautionary Principle

The Official Opposition believes the responsibility for risk management must be shared between the PMRA and industry, and therefore, that it is essential that industry and other stakeholders agree on the principles guiding risk management. Further, as the government looks to modernizing its risk management approach across a number of products and departmental jurisdictions industry, other stakeholders and the public must be clear on how risk management is being applied to specific product approvals. Risk management must include properly established ground rules for the use of the precautionary principle.

To accomplish clear direction for the use of the precautionary principle, there must be agreement on which definition is in use. For example, CEPA '99 offers the following language to guide the use of the precautionary principle.

> Whereas the Government of Canada is committed to implementing the precautionary principle that, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. Source: CEPA '99, Preamble

Pesticide Use in Urban Settings

The use of pesticides in non-agricultural settings has become a subject of considerable controversy, and unfortunately the issues and arguments within this debate have polarized many stakeholders.

The Official Opposition regrets that the Committee Report has done very little to recognize the importance of the products in non-agricultural sectors, and the role the products play in controlling weeds, insects, fungal and other diseases. The benefit of pesticides lies in their ability to manage a pest (weed, insect or disease) that becomes out of control and affects the health of citizens, pets and plants, and threatens the quality of homes, lawns, schools and businesses.

The Committee Report has done little to further the understanding of the need for pesticides in urban environments. Pesticides are important to allergy sufferers in alleviating the discomforts associated with weeds, pollen and moulds. Most homeowners and communities take great pride in their properties, and pesticides are one tool to create healthy environments. Gardening is now the number one hobby of North Americans over the age of 35, and pesticides are critical to protecting grass, plants, trees and ornamentals from disease. Statistics show that injury rates to sports participants are higher when games are played on poorly maintained sports surfaces. Over 40% of ankle and foot injuries to school athletes were attributable to poorly maintained field conditions, and pesticides play an important role in maintaining quality turf.

Managing golf courses is another challenge and an example of the importance of the products. Turfgrass disease can be a significant problem on golf course tees and greens, and without the use of fungicides, certain fungal diseases can kill acres of grass overnight and shut down a golf course.

While the Official Opposition is supportive of developing and using proven alternatives in urban environments, we do not believe that a moratorium on pest control products should be put in place before there is a substantial body of conclusive scientific evidence that unequivocally links such products to human disease or ill health. Such a drastic action could put Canadians at risk, and create an unhealthy environment with weeds, insects and disease going unchecked. A moratorium fails to recognize the value and importance of pest control products, and clearly reflects a lack of appreciation and understanding of pest management challenges in Canada.

The Official Opposition believes that proven, sound science, domestically and internationally, should continue to be the cornerstone for debate. As the public gains greater knowledge and acceptance of this science, many fears will be relieved, and the debate that emerges will lead to the development of public policy that is balanced and reasoned.

The Official Opposition encourages a national pest management education program with industry that will further the knowledge of Canadians surrounding pest management challenges and the tools to deal with them.

The Need for Accountability and Transparency in the Regulatory System

While Canada's risk management strategies are leading the world in many respects, there is opportunity for the development of even better methods of assessing the risks that toxic substances may present to people, animals, and the environment. The Official Opposition has found stakeholders eager to work with government to ensure these improvements in risk management practices and processes are implemented in Canada. If the PMRA clarifies for stakeholders, parliament and the general public the principles and the steps taken to implement a risk management decision process, and makes this process more transparent, such action would go a long way toward enhancing public confidence, and accountability in the regulatory system.

Every effort should be made to align Canada's risk management practices with those of our trading partners and through Canada's membership in organizations such as the OECD.

The Need for a Co-ordinated Effort Between Government Departments and the PMRA

The Environment Commissioner expressed serious concern over the credibility gap that exists between talk and action in the federal government's environmental agenda. Federal departments are not working co-operatively on environmental issues. The lack of co-operation in interdepartmental information sharing is a systemic and chronic problem that only reflects the mismanagement malaise that has persisted under the Liberal government.

The Official Opposition believes that a clear understanding of environmental regulation and research responsibilities between federal and provincial governments must be achieved, together with co-operation from the private sector, to identify the best way to achieve harmonized environmental objectives. The Official Opposition believes the single agency model of the PMRA provides for

greater accountability and efficiency in pesticide regulation. Where necessary, we support redesigning a proper structure for research and information sharing that ensures the system is both efficient and cost effective.

Clarifying Authority Regarding Pesticides between other Federal Legislation

The Official Opposition rejects the Committee's view that new legislation is needed. We suggest that where necessary, existing legislation should be changed or strengthened to reflect changes within the industry. On this subject, the Official Opposition views with caution the recommendation made by the Committee that a "new Act authorize the exchange of confidential information, including trade secrets and confidential business information, between federal institutions...," insofar as such a recommendation creates the potential for intrusion into the area of intellectual property rights, or a violation of fundamental individual and corporate freedoms. A more thorough investigation of these issues is necessary before adopting this recommendation.

The Official Opposition believes that it is appropriate that legislation relating to pesticides in Canada be covered solely by the *Pest Control Products Act*, or eventually under one Act. We support efforts to clarify conflicts in existing legislation in a way that resolves those conflicts in a timely manner, and with the greatest degree of rationalization.

III. KEEPING CANADA COMPETITIVE: THE NEED FOR GLOBAL THINKING IN THE PMRA

The Issues of Risk Management and Re-evaluation

The Official Opposition believes it is inappropriate for the PMRA to be transferring new product evaluation resources toward re-evaluation activities. New product registrations should not be delayed by re-evaluation activities because new products tend to be safer and more environmentally sound. The efficiency of the PMRA's registration operations has a direct impact on Canada's ability to remain competitive internationally. Canada's agriculture producers risk losing their competitive advantage when new product evaluations are delayed.

The Issue of Harmonization Within an Era of Globalization

The Official Opposition is very supportive of re-evaluation where scientific evidence points to new risk and where it does not result in the duplication of the work conducted by other OECD countries. While we believe that Canada should lead the re-evaluation process when the re-evaluation relates to a Canada-specific situation, opportunities to accept OECD decisions or to co-ordinate re-evaluation activity among other industrialized countries with regulatory systems similar to the Canadian system should be fully utilized. Given that fully 50% of Canada's agricultural production is exported to the United States, priority effort must be made to align re-evaluation activities with those of the U.S.

The PMRA should step up work with Agriculture and Agri-Food Canada, and the Departments of Foreign Affairs and International Trade to harmonize data requirements with NAFTA partners and those of other OECD countries. In doing this, the PMRA could eliminate duplicate equivalent testing being done in other jurisdictions, streamline new product registrations even as re-evaluations are being conducted, and confer a greater health benefit to Canadians and the environment. To this end,

the Official Opposition believes the PMRA must place solutions for managing pesticides in Canada within a global context, thus ensuring Canada remains competitive.

IV. PROMOTING PARTNERSHIPS BETWEEN THE PMRA AND STAKEHOLDERS

Building on Voluntary Initiatives

The Official Opposition agrees with the Environment Commissioner's recommendation that voluntary programs should be evaluated for their contribution "toward ... the objectives of pollution prevention and life cycle management." Industry-led initiatives such as the Crop Protection Institute's *StewardshipFirst* is an example of a program that meets the Commissioner's test of contributing to pollution prevention and life cycle management, and promotes a healthy environment. *StewardshipFirst* is a seven point program that focuses on: manufacturing and marketing code, warehousing standards, personnel certification, grower safety, container management and obsolete product management. The Official Opposition supports such initiatives, and notes that this initiative has so far enjoyed considerable success. This is yet another indicator that industry takes seriously its responsibilities and obligations with respect to health and safety for humans and the environment. As Mr. Lorne Hepworth, President of the CPI states concerning the Institutes's *StewardshipFirst* program, "...it's more than a set of codes and standards, it is an ethic that influences our actions." The Official Opposition urges the PMRA to do more to build on initiatives such as these to build stronger partnerships with all stakeholders.

Establishing a Sales Database

The PMRA, as a member of a **national working group**, must meet its commitment to establish a national database of pesticide sales to monitor use of pesticides and the effectiveness of risk reduction activities. While the Official Opposition fully supports the concept of a sales database in principle, we believe that aggregate use, rather than aggregate sales, would more accurately measure the levels of pesticide risk.

Summary of Recommendations

Recommendation: Clarifying application of the Precautionary Principle

1) That the Rio definition of the precautionary principle as defined in CEPA '99, be accepted as the standard principle within risk management strategies, and that the application of this principle be clarified for all stakeholders.

Recommendations: Risk management, Accountability and Transparency

2) That the PMRA make its risk management decision process public, fostering greater transparency and accountability.

3) That the PMRA more proactively consult key stakeholders, including registrants, on all risk management principles guiding regulatory activity, and address the public's risk perception.

Recommendations: Co-ordinated Action Between PMRA and Federal Departments

4) That the infrastructures for research and information sharing among and between federal departments be re-evaluated and re-designed, where necessary, to provide for greater co-ordination among those departments concerned with regulation, risk assessment and research into the environmental impacts of products.

5) That the PMRA be directed to work with other federal departments, including the departments of Environment, Agriculture and Agri-food, Fisheries and Oceans, as well as the Canadian Food Inspection Agency, to clarify potential conflicts in current legislation.

6) That federal legislation be amended in such a way as to designate sole responsibility to the PMRA for risk assessment.

7) That all federal-provincial legislation be clarified in such a way that any conflicts in existing legislation are resolved in a timely manner, and with the greatest degree of rationalization.

Recommendations: Role of PMRA in Achieving Harmonization Within Era of Globalization

8) That the PMRA establish priorities for re-evaluation in collaboration with other OECD countries, with particular emphasis on the United States.

9) That the PMRA be directed not to fund re-evaluation activities by shifting resources away from new product evaluations.

10) That the PMRA work with Agriculture and Agri-Food Canada and the department of Foreign Affairs and International Trade to accelerate efforts towards harmonization with NAFTA partners, and continue to work with OECD member countries toward globally accepted requirements for pesticide regulation and the mutual acceptance of data.

Recommendations: The PMRA Should Build on Voluntary Partnerships

11) That the PMRA and industry continue efforts to complete current pilot projects for the collection of sales data as a foundation for evaluating the best indicators of pesticide use.

12) That the PMRA is encouraged to explore pesticide alternative options, including continued integrated pest management development, to achieve the objectives of monitoring pesticide usage and gauging the effectiveness of risk reduction activities.

MINUTES OF PROCEEDINGS

Tuesday, May 2, 2000
(*Meeting No. 36*)

The Standing Committee on Environment and Sustainable Development met *in camera* at 8:51 a.m. this day, in Room 209, West Block, the Chair, Charles L. Caccia, presiding.

Members of the Committee present: Charles L. Caccia, Jocelyne Girard-Bujold, Dennis Gruending, Rahim Jaffer, Joe Jordan, Walt Lastewka, David Pratt, Julian Reed and Paddy Torsney.

Acting Members present: Raymonde Folco for Marlene Catterall and Antoine Dubé for Jean-Guy Chrétien.

In attendance: From the Library of Parliament: Monique Hébert, Researcher; Christine Labelle, Researcher; Linda Webster, Researcher.

The Committee discussed its future business.

It was agreed, — That the Committee hold a meeting, before the June adjournment of the House, on climate change with officials attending the 6th Conference of the Parties (CoP6) to the United Nations Framework Convention on Climate Change to take place in November 2000 in The Netherlands to be called as witnesses.

It was agreed, — That the Committee hold a joint meeting on May 9 with the United Kingdom House of Commons Committee on Environmental Audit.

It was agreed, — That on the day of tabling the 2000 Report of the Commissioner of the Environment and Sustainable Development, May 29, 2000, the Committee organize a pre-tabling lockup and a hearing on the Report with the Acting Commissioner and his staff as witnesses.

Pursuant to Standing Order 108(2), the Committee resumed its study on the management and use of pesticides in Canada including an evaluation of the performance of the Pest Management Regulatory Agency in preventing pollution and in protecting the environment and human health.

The Committee resumed consideration of a draft report.

It was agreed, — That the Committee adopt the draft report, as amended, as its 1st Report to the House and the Report be entitled *Pesticides: Making the Right Choice for the Protection of Health and the Environment*.

It was agreed, — That the evidence taken by the Committee in relation to its study on pesticides during the 1st session of the present Parliament, be deemed adduced by the Committee in the current session.

It was agreed, — That the Chair be authorized to make such editorial and typographical changes as necessary without changing the substance of the Report.

It was agreed, — That, pursuant to Standing Order 108(1)(*a*), the Committee authorize the printing of brief dissenting opinions, to be submitted in the two official languages to the Clerk.

It was agreed, — That 4,000 copies in English and 1,000 copies in French with a special cover be printed.

It was agreed, — That the Chair be authorized to present the Report to the House.

It was agreed, — That, after the Report is tabled, a press release be issued and circulated by Canada Newswire Ltd. to all newsrooms in Canada and a press conference take place.

At 12:28 p.m., the Committee adjourned to the call of the Chair.

Stephen Knowles
Clerk of the Committee